ROADS and STREETS

UNIVERSITY MICROFILMS
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HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

A GILLETTE PUBLICATION

Gillette Publishing Co., 22 West Maple St., Chicago 10, Illinois • Accepted as Controlled Circulation Publication at Milwaukee, Wis.

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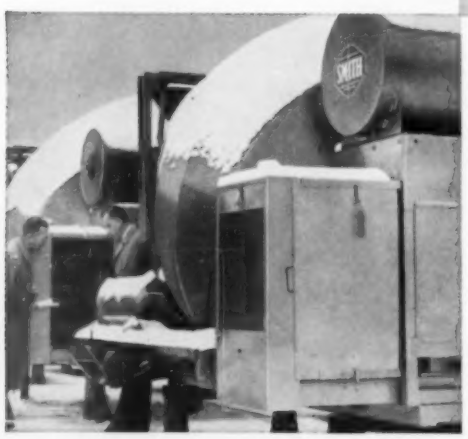
November, 1958

why T. L. Smith Co. powers with Chrysler Industrial Engines

T. L. SMITH EXECUTIVES, Richard R. Kupfer, Director of Purchases (left); Raymond W. Mueller, Project Engineer, inspect Chrysler Ind. 30 Engine which powers all T. L. Smith separate engine mixers—nine models, 5 to 9 yard capacity.



Ready-mix concrete mixers demand rugged power. Most work, for example, is off the road and the mixer engine is subjected to severe jolting and sudden load shifts. The engine is also forced to operate in an atmosphere of abrasive cement dust. The engine is required to turn drum loads ranging up to 40,000 lbs. Operating speeds fluctuate suddenly from 2400 rpm during loading to 800 rpm during agitation.

T. L. Smith Co. has found that Chrysler Industrial Engines are engineered and built to meet these rugged demands better than any other engine in the field. Chrysler's fluid coupling, for example, absorbs sudden load shocks, prolongs engine life. Chrysler's efficient oil-bath air cleaner keeps harmful cement dust from fouling the engine. Chrysler Engines have also proved able to operate at continuous low speeds under heavy loads for long periods without excessive carbon build-up. Most important, Chrysler's day-in, day-out dependability means minimum down time for T. L. Smith customers. In fact, many Chrysler-powered units which are still on the job after six and seven years have never had a major maintenance problem.

SEND for 1958 CHRYSLER INDUSTRIAL ENGINE CATALOG: Dept. G11, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.

Chrysler
INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

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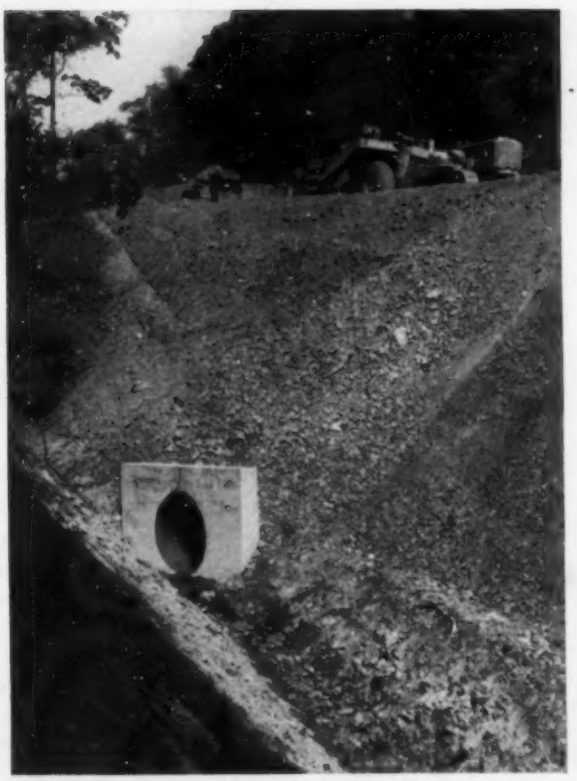
For shallow fill or deep Beth-Cu-Loy pipe flexes with the load



Because galvanized corrugated Beth-Cu-Loy pipe is made of steel sheets, it is not only strong, but flexible. So whether the fill is shallow or deep, a Beth-Cu-Loy pipe has the unique ability to "give" with the fill and transmit the load around its entire periphery.

Rigid pipe cannot flex with the load, and thus is unable to transfer any appreciable portion of the load to the surrounding material. The bulk of the pressure is exerted through the vertical axis of the pipe. That's why many states actually specify the use of sheet metal pipe such as Beth-Cu-Loy under fills of less than 2 ft or more than 15 ft.

Flexibility, of course, is only one advantage of galvanized Beth-Cu-Loy culvert drainage pipe. The zinc coating (2 oz triple spot test) provides long resistance to corrosion. The pipe's light weight permits easy handling and quick installation of long pipe lengths, and reduces shipping costs. Field joints can be made in minutes, with no time out for setting or curing.

Bethlehem does not manufacture culvert pipe, but does supply Beth-Cu-Loy (copper-bearing steel) sheets to pipe fabricators. If you would like further information about Beth-Cu-Loy, or the pipe made from it, ask your fabricator for a copy of Bethlehem Booklet 425-A.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

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ROADS AND STREETS

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- *Slag Made Fine Fill*—And haul roads, too—enabling Langenfelder's airfield job to be completed months ahead of schedule despite wet winter and spring.
- *115,000 C.Y. Per Day*—Quite a clip for any earthmoving job. This airfield grading project made use of a lot of equipment, and all the tricks.
- *Three Aggregates Did It*—Same stockpiles used for stabilized base, binder mix and surface course mix on this Oklahoma asphalt paving project—at a saving all along the line.
- *California Looks to 1980*—When California's population reaches 31 million 22 years hence, bringing tripled traffic, this state will be ready with a 12,500-mile Freeway program if recent study report is adopted.

Look for this nearby Goodyear dealer sign for better tire values—better tire care.

New SUPER HARD ROCK LUG

Tubeless or Tube-Type

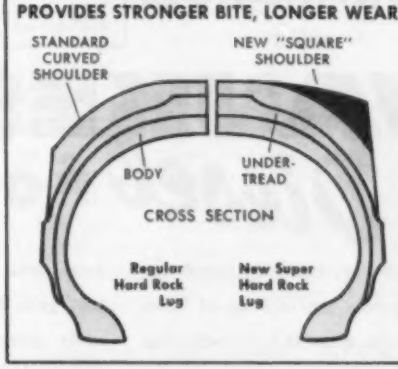
This new SUPER HARD ROCK LUG is *truly* wide-base, from tread–to shoulder–to bead!

BONUS RUBBER–and plenty of it–*right where you need it most.* Result? *Super* traction, *super* flotation, *super* stability–and *super* resistance to shoulder snags and cuts.

Best news of all: *SUPER HARD ROCK LUG costs no more than conventional wide-base off-roaders!* Get more tire for your money! Get this great new wide-base yardage champ at your Goodyear dealer's now.

Goodyear, Truck Tire Dept., Akron 16, Ohio.

SEE HOW DEEPER SHOULDER DEPTH PROVIDES STRONGER BITE, LONGER WEAR:



Like steel, tire cord must be tempered to be tough. Goodyear's exclusive 3-T process, involving Tension, Temperature and Time, triple-tempers cord to make it TRIPLE-TOUGH–to give you longest tire life, lowest cost-per-yard!

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

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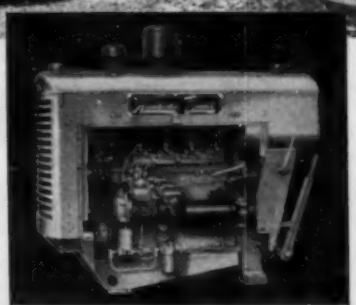

Powerful Waukesha Utility Four—Model 180-DLCU Diesel—four cylinder, 3½-in. bore x 3¾-in. stroke, 144 cu. in. displacement, counterbalanced crankshaft.

REICH *drills* either way
ROTARY or DOWN-THE-HOLE
with

WAUKESHA *Diesel* POWER

The *small* rig that's designed for down-the-hole tool drilling of holes up to 6½-in. diam. in hard rock—the Waukesha Diesel-powered, Model C-250 Reich Drill is said to be the only machine of its kind in the world. It does the work of small hard rock rigs that drill with drifters; and large hard rock machines that drill with down-the-hole tools. But the Reich is only half the size... and half the cost...of large machines. The makers, Reich Bros. Mfg. Co., Terre Haute, Ind., gave the drill an equally versatile power unit. The Waukesha 180-DLCU has special Diesel design characteristics including the patented spherical combustion chamber which gives lively responsive acceleration, smoothness of operation, and clean burning with high economies both of maintenance and fuel. Get the details of Waukesha dependability in Bulletin 1627.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK TULSA LOS ANGELES 399

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ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 66 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

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Publication and Editorial Offices:
22 West Maple Street, Chicago 10, Ill.
HALBERT P. GILLETTE
Founder and President
(1869-1958)
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Out of sight, across a meadow, a small stream, and a two-lane road, a Tellurometer receiver works with this transmitter operator to measure the distance between. It took only 10 minutes to obtain the reading . . . 2,309.7 feet.

THIS IS HIGHWAY SURVEYING . . . IN 1958

The young man above is one of a party of four which, armed with a Tellurometer system, established up to 25 stations of highway traverse a day in West Virginia this summer. Engineers are finding the new electronic distance-measuring system ideal for topo mapping, highway, pipeline, transmission line, establishing picture points for aerial surveys, and other horizontal control work. --

SPEED

It requires only two men to operate a system, one at the transmitter, the other at the receiver. A four-man crew can really make time! It takes only 20 minutes to measure any distance—from 500 ft. to 40 mi.—including setting up both instruments, taking readings and dismounting to move on to next station. Operators do not need to be able to see each other. And the instruments are unhampered by fog, rain or darkness.

ACCURACY

The Tellurometer system is capable of accuracies of 1 part in 300,000 ± 2 inches, far in excess of highway mapping specifications. Users obtain 3rd order results on lines 500 to 1,500 ft.; 2nd order on lines 1,500 ft. to 1 mi.; and 1st order on lines 1 to 40 mi. long. Systems can be calibrated individually to produce even greater accuracies on short lines. The instrument completely outmodes traditional tedious, time-consuming methods for many assignments.

ECONOMY

Federal and state highway engineers estimate 40% savings in the cost of establishing horizontal controls. Consulting engineers and photogrammetrists regularly report highway traverse surveys completed in less than half the normal time required. This means tremendous savings in manpower costs. It means speedier completions. And field crews like the Tellurometer System because it is rugged, easy to operate and portable. No complicated training required.

To save time . . . to save money . . . swing to Tellurometer systems

For more details, mail coupon

TELLUROMETER, INC.
224 Dupont Circle Building • Washington 6, D. C.

Please send me complete information

NAME AND TITLE _____

ORGANIZATION _____

ADDRESS _____

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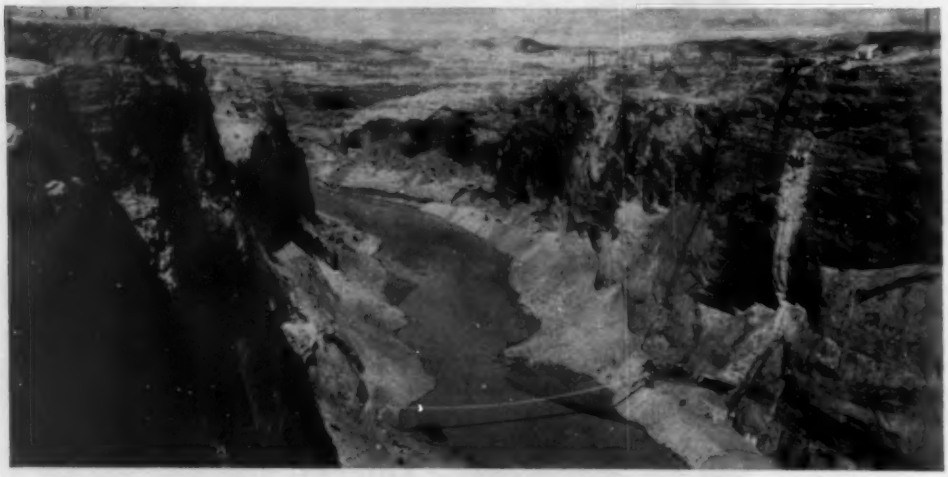
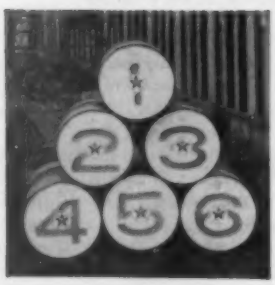
SECOND LARGEST DAM IN THE U. S., at Glen Canyon, Ariz., will incorporate two of these 2,800 ft. diversion tunnels. Frazier-Davis equipment runs dependably, stays on the job, thanks to the Texaco Simplified Lubrication Plan.



Glen Canyon tunnel borings nearing completion with Texaco Plan



Only 6 lubes needed to keep Frazier-Davis equipment working dependably

This is Frazier-Davis Construction Company's job: to bore the east side diversion and service tunnels, with a combined length of 2½ miles, through the walls of Arizona's Glen Canyon. It's a vital project, part of the Bureau of Reclamation's $760 million development of 10,000 square miles of arid land. On a job as big as the Glen Canyon Dam, on-time completion of every phase is absolutely essential. And that puts a priority on dependable equipment performance.

The Texaco Plan keeps equipment on the job—at lowest cost—by handling all major lubricating problems with no more than six products. A combination of specialized and multi-purpose lubricants assures proper lubrication for each machine, with lower lubricant inventory and less chance for mistakes. For Frazier-Davis, the Texaco Simplified Lubrication Plan has proved to be one of the most economical and dependable ways to get top performance from every piece of equipment.

Here are the lubricants Texaco recommended for Frazier-Davis:

Texaco Ursa Oil Heavy Duty—keeps engines clean, rings free, valves properly seated for full power.

Texaco Regal Oil R&O—prevents formation of rust and harmful deposits in compressor systems.

Texaco Universal Gear Lubricant EP—keeps differentials and transmissions running smoothly at low cost.

Bureau of Reclamation photos

Texaco Marfak Multi-Purpose 2—protects wheel bearings, chassis, water pumps against dust, moisture and wear.

Texaco Track Roll Lubricant—prolongs the life of crawler mechanisms.

Texaco Rock Drill Lubricant—guards against wear and rust whether drills are running or idle.

Ask a Texaco Lubrication Engineer to help you simplify your lubrication problems and reduce costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

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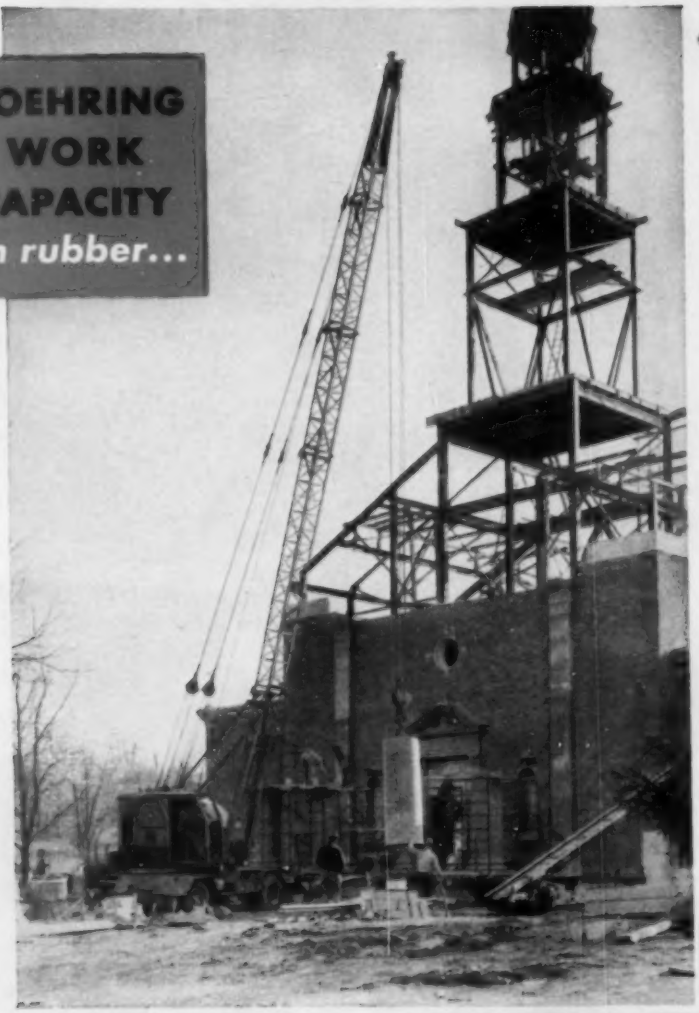
KOEHRING WORK CAPACITY *on rubber...*



Heavy church pillars, and elaborate pre-cast concrete base and cap sections received careful, precision handling with this Koehring® 205 Cruiser® crane on the job. Carrying 65-foot boom, it set up row of tall columns at church entrance, and helped erect steeple and high, arched roof. *One man* controls all operations — *one engine* supplies all power for work and travel on this 205 Cruiser. There's a full range of working speeds up to 7 mph — *plus travel speeds up to 21.5 mph!* Has torque-converter on 4-wheel drive, automotive power-steering, 27½-foot turn radius, 30% gradability. *Lifts up to 15 tons.* Boom lengths: 25 to 70 ft. — or max. 95-ft. boom-and-jib. Highway travel unrestricted. Overall width, 8 ft. Axle-load distribution meets highway regulations in most areas, even when carrying 25-ft. folded boom.

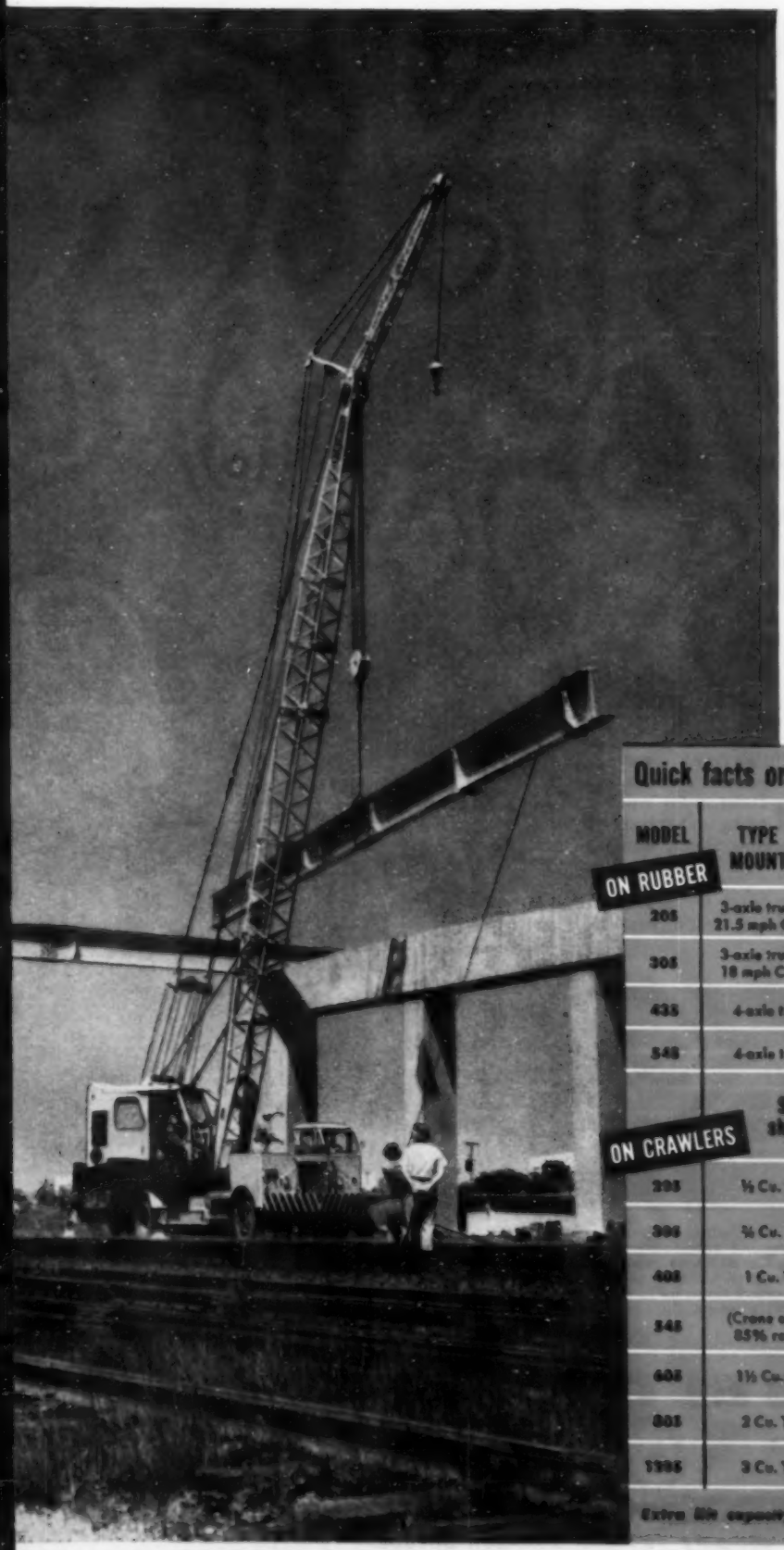
A large companion-model Cruiser has just been added to the Koehring line — new 305, with 25-ton lift capacity, and travel speeds up to 18 mph.

45-ton handyman — To unload and place skid-mounted mud pumps, engines and other machinery for a new oil field installation, a big 545 truck crane (right) was put to work. Heaviest load was 23 tons — an easy lift for the Koehring 545! In fact, it can pick up 45 tons with 40-foot boom *at 15-foot radius.* On high-lift work, it handles up to 120 feet of main boom — or 150 feet of boom-and-jib. Removable counterweight, boom and outriggers reduce machine weight — give quick conversion from fully-equipped crane to roadable machine for highway travel. Top road speed on mobile 545 is 31.8 mph.

All models on rubber and crawlers are listed in chart on next page. Pick the size that best suits your needs — then ask Koehring distributor to demonstrate it. Call today.

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wisconsin

Koehring excavators and cranes also manufactured in: CANADA • ENGLAND • SPAIN • JAPAN



Highway overpass—Look at the reach of this Koehring 305 truck crane setting steel girders on a new bridge. It's handling the heavy loads off the end of a 60-foot boom — and carries a 15-foot jib for the extra-high lifts. But that's not the limit of its reach. This truck-mounted 305 can raise up to 100 feet of main boom, or maximum 130-foot boom-and-jib, *with low A-frame!* Butt-connected boom is safe — solid. Inserts are easily changed. Only 2 bolts per corner. Lifting capacity of 25 tons (see chart) increases *work capacity* with all attachments. As a clamshell or dragline, truck-mounted 305 handles ¾ to 1-yard buckets, converts to ¾-yard shovel or hoe. Also available on crawler mounting — *or as an 18-mph self-propelled Cruiser crane.*

Quick facts on KOEHRING WORK CAPACITY:

MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER			
205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
305	3-axle truck, or 18 mph Cruiser	30,000 lbs.	at 12-ft. radius
435	4-axle truck	70,000 lbs.	at 15-ft. radius
545	4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
205	½ Cu. Yd.	20,000 lbs.	at 10-ft. radius
305	¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
405	1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
545	(Crane only — 85% rating)	90,000 lbs.	at 12-ft. radius
605	1½ Cu. Yds.	72,300 lbs.	at 12-ft. radius
805	2 Cu. Yds.	104,200 lbs.	at 12-ft. radius
1255	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

Extra lift capacity means . . . MORE WORK CAPACITY WITH ALL ATTACHMENTS

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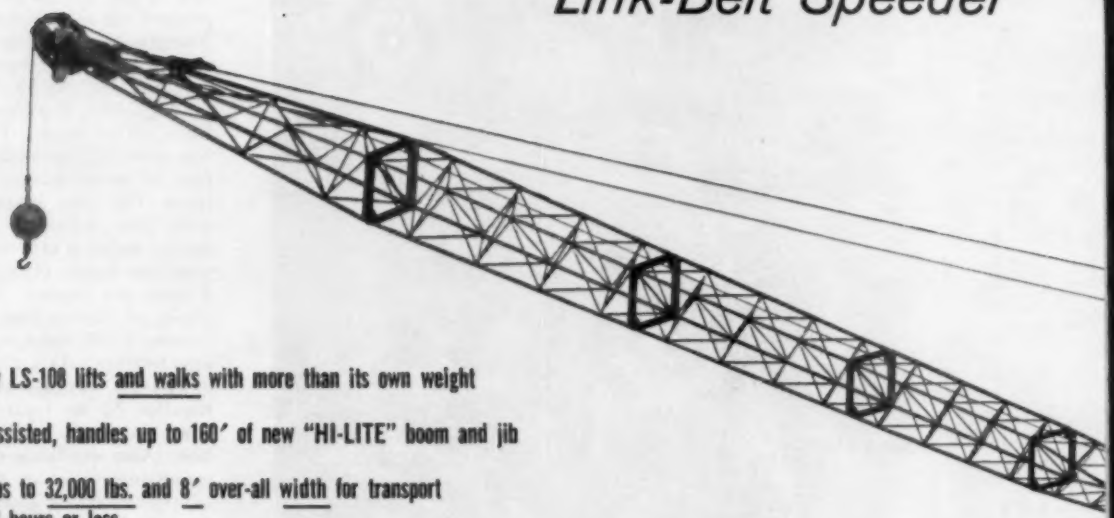
Link-Belt Speeder

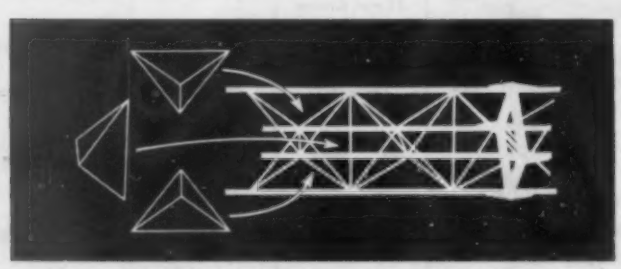


- **New LS-108 lifts and walks with more than its own weight**
- **Unassisted, handles up to 160′ of new "HI-LITE" boom and jib**
- **Strips to 32,000 lbs. and 8′ over-all width for transport in 2 hours or less**

Here's a machine that combines high lifting capacity with exceptional mobility and transportability. Imagine a lifting crane that lifts and walks with 80,000 lbs. and yet quickly strips down for transport from 78,200 lbs. to approximately 32,000 lbs. and an 8 ft. overall width in two hours or less.

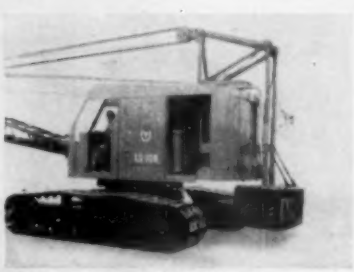
In addition, compare this list of lifting crane features with any other crane on the market: power hydraulic controls, two-speed travel in either direction, reversing clutches for either or both main operating drums, independent swing and travel, independent rapid boomhoist with boom-lowering clutch, powerful third drum and many others.

See your Link-Belt Speeder distributor for new catalog and full information or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 14,067



Revolutionary "HI-LITE" booms feature new tetrahedron design that virtually eliminates the effect of whipping, twisting and deflection normally experienced with long booms. Sets of internal cross-braces meet at common points along the 44" square box section forming scores of tetrahedrons (pyramid-like structures) . . . provide maximum resistance to stress in every direction. High-strength steel tubing is light weight . . . permits longer booms than previously possible.

2 hours or less to strip down from 72,800 lbs. to approximately 32,000 lbs. and 8′ width for road transport.



1. Use the powered retractable gantry to remove counterweight.

2. Move LS-108 onto lowboy from the side, taking advantage of power steering.

LINK-BELT SPEEDER

It's time to compare . . . with Link-Belt Speeder

announces

NEW 40-TON CRAWLER CRANE

An entirely new low-cost concept in 40-ton lifting cranes is introduced by the LS-108! Convertible to standard hoe, clamshell or dragline attachments. The economical LS-108 is built to carry heavy loads in continuous service . . . and access for service is exceptionally easy.

3. Block up and remove one crawler side frame without assistance from auxiliary crane.

4. Block up and remove other crawler side frame.

5. After removing attachment (and with crawlers on separate trailer) you are ready to go at only 32,000 lbs. and 8' width.

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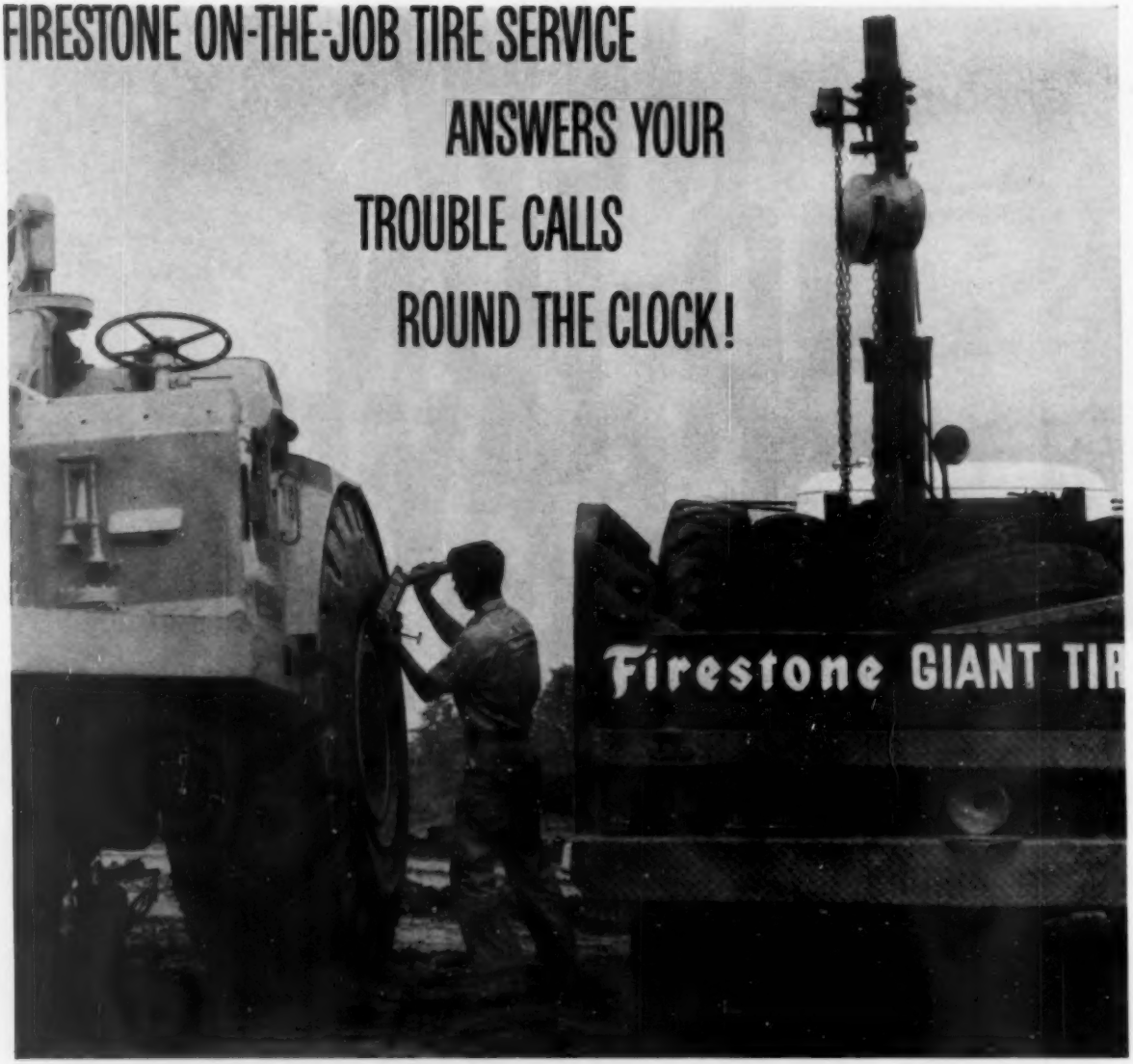
FIRESTONE ON-THE-JOB TIRE SERVICE ANSWERS YOUR TROUBLE CALLS ROUND THE CLOCK!



Firestone Giant Tire Service eliminates hours of costly downtime!

Firestone service trucks are on the job 24 hours a day to beat your downtime due to tires. Completely equipped trucks are ready to service construction tires on the spot. Trained servicemen have the know-how and the tools to handle the largest tubeless or tubed off-the-highway tires. Besides emergency tire service, a Firestone Tire Expert inspects tires regularly—checks for proper inflation. Count on Firestone to turn downtime delays into worktime profits! Contact your Firestone Dealer or Store about Firestone's Giant Tire Service. Combine Firestone's Giant Tire Service with Firestone off-the-highway tires to hold down tire costs. Remember—there's a Firestone tubeless or tubed tire for every piece of equipment on construction projects.

ROCK GRIP WIDE BASE® ROCK GRIP®
TUBELESS OR TUBED

When ordering new equipment always specify Firestone tires.

Enjoy the Voice of Firestone on ABC television every Monday evening.

Firestone

BETTER RUBBER FROM START TO FINISH

Copyright 1958, The Firestone Tire & Rubber Company

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CUT THE COST AND TIME for moving your big rigs!

Boom and Basic Machine travel to job on separate trailers.

ONLY 4 HOURS FROM START TO WORK!

Boom is fitted to basic machine.

WHAT is it costing you to move a 2½-yd. Shovel from job to job? How much is lost in time? Some machines in this capacity range, take up to two-days and require an extra crane.

Your Northwest 80-D, 2½-yd. Shovel can be reduced in weight for road travel and be on the job in a matter of hours. Northwest 80-D's have been dismantled, put over the road 20 miles and working on the job in 8 hours. The machine pictured, owned by the Consumers Company of Milwaukee, was dismantled, loaded on trailers, erected and on the job in only 4 hours.

Moving your Northwest 80-D is a simple operation. The boom is lowered to the truck or trailer bed and unbolted from the base. Cables and Crowd Drum are part of the boom assembly. Cables are coiled back on the boom. The basic machine backs out and loads itself on another trailer. The procedure is reversed on arriving at the job and the machine goes to work. Further reduction in weight can be had including removable counterweight on your Northwest. No crane is needed. Two men with ordinary tools can do the job! It is quick, easy and a real time and money saver. Another of the many Northwest advantages for making money for you. Ask for details.

Four hours later the Northwest is fully assembled and at work.

Always Ready to GO

NORTHWEST ENGINEERING COMPANY
1504 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

. . . for more details circle 294 on enclosed return postal card

NORTHWEST

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
⅜ Yd. to 2½ Yd. Capacity	15-Ton to 50-Ton Capacity	⅜ Yd. to 3 Yd. Capacity	⅜ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

5-58-48-ICG

NEW CHEVROLET

New Might...New Models!

Task-Force 59 brings you more to work and save with in every weight class—more models, thriftier engines, stronger cabs and frames, safer brakes, tougher axles and transmissions! Here's the longest, strongest line of Chevrolet trucks ever built, the best yet of the best sellers!

Good news in the light-duty class! Chevy's longer, stronger '59 line gives you a *dozen* big pickups to choose from . . . new 4-wheel drive models, newly fashioned panels, Step-Vans, and Sedan Deliveries! Scores of innovations include new hard-pulling Positraction rear axle, new bigger brakes, new stronger cabs, new broad-shouldered styling refinements!

Bright new middleweight and heavyweight might! New Series 50H and 60H models with heavy-duty components give G.V.W.'s up to 21,000 lbs. . . . while new Low Cab Forward trucks in Series 50 and 70 make pulling maximum-length trailers easier and more economical than it's ever been before! There are new 5-speed transmissions for extra pulling power; here, too, are huskier, longer lasting clutches; 15,000-lb. rear axle with new durability features—and mammoth 16,000- and 18,000-lb. rear axles.

New thriftier 6's, all-new V8 power! Chevy's best selling 6's are set to pinch pennies like never before with new camshaft design, new valve train durability . . . horsepower and torque to spare! *Six* big V8's match short-stroke power to your job; they're even tougher built and more reliable for '59, with high horsepower ratings that range from 160 to 230. And an *all-new* V8—the 185-h.p. Workmaster Special* is available in Series 70 and 80 models.

See the bright new trucks of Task-Force 59 at your Chevrolet dealer's now! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**Optional at extra cost.*

CHEVROLET

TRUCKS FOR '59!

New Money-Saving Power!

CHEVROLET TASK·FORCE 59 TRUCKS

. . . for more details circle 272 on enclosed return postal card

How **TAMPO MANUFACTURING COMPANY** mounts front bolster king pin assembly of its Model SP-11S Roller on Timken bearings to insure easy steering under heavy, varying loads.

Steers 11 tons one-handed with TIMKEN® bearings to absorb the heavy, varying loads of uneven ground

IT takes more than power steering to keep this new 11-ton Tampo Model SP-11S Roller in a straight line on uneven surfaces. To keep the front bolster assembly rigid, allow easy, sure steering under heavy and varying wheel loads, Tampo engineers mount it on Timken® tapered roller bearings. And they use Timken bearings at 18 other vital points on wheels and axles.

Tampo and other leading construction equipment manufacturers use Timken bearings because:

LOADS NO PROBLEM. Timken bearings' tapered construction lets them take all combinations of radial and thrust loads. And full-line contact between rollers and races gives Timken bearings *extra* load-carrying capacity.

REDUCE MAINTENANCE. Because they hold shafts concentric with housings, Timken bearings make closures more effective. Dirt stays out, lubricant in.

PROVIDE LONGER LIFE. Geometrically designed to roll true and precision-made to live up to their design, Timken bearings practically eliminate friction. They *roll* the load. Bearings and related parts last longer.

To further insure bearing quality, we make our own fine alloy steel. No other American bearing maker does. To get all these advantages, specify bearings trade-marked "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD

TRADE-MARK REG. U. S. PAT. OFF.

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ROADS AND STREETS
Sixty-Six Years of Editorial Leadership

Washington News Letter

Exclusive - By Duane L. Cronk, Director, Highway Information Services

November 10, 1958

The American Automobile Association has issued a warning that a "complete shutdown on apportionments for the Interstate System looms as a threat" for fiscal 1961 unless Congress takes corrective action next year. AAA, and other highway organizations, are concerned about the uncertainty of the pay-as-you-go nature of the National Highway Program, which has been only temporarily modified. For although Congress has authorized record sums for the Interstate construction, the revised estimates of cost have made the present financing plan grossly inadequate.

The last Congress delayed the day of reckoning by lifting the Byrd amendment for 1960. But the 1961 authorization is well in excess of funds which will be available and new revenues must be found, or the general fund tapped to make up the difference.

AAA is against another federal gasoline tax increase, and urges, instead, that the federal government earmark national defense funds to complete the Interstate net. The motorists' organization has marshalled a variety of arguments to have the big System classified as a prime national defense facility and approved as a recipient of defense appropriations. "Why should motor vehicle owners be singled out to bear the tax load for the entire Federal-aid highway program?" AAA declared last month.

* * *

An enlightening report on the volume of steel used for highway construction has been released by the Bureau of Public Roads. It reveals the following "consumption," per million dollars of contract construction, during the last three years:

Structural steel	240 tons
Reinforcing steel	195 tons
Culvert pipe	35 tons
Miscellaneous steel	44 tons

The comprehensive table is broken down by states and by federal-aid systems. And it indicates increases and decreases among the various kinds of steel products. Highway industry readers interested in obtaining copies ("Highway Construction Usage Factors for Steel") should write directly to M. B. Christensen, Construction and Maintenance Division, U. S. Bureau of Public Roads, Washington 25, D.C.

(Also just completed by Bureau of Public Roads experts, a study on the current usage and economies of various structural bridge steels. The report by Nathan W. Morgan of the BPR Bridge Division explores the properties and prices of 37 different structural steel elements.)

(continued on next page)

An aggressive program to improve the quality of bituminous concrete has been adopted by the National Bituminous Concrete Association. NBCA will undertake a five-year research program intended to solve many of the controversial questions about asphalt pavement design and construction. A 10-point program covering all facets of bituminous asphaltic pavement design and construction will include investigation into production, stockpiling and feeding of aggregate to the plant; drying; methods of screening, storing, and proportioning in the plant; production of the bituminous mixture; transportation of mix to paver; laydown procedure and rolling; quality of aggregate, cement and composite mix; bases; general workmanship; and construction practices and materials. "The industry has a vital stake in better bituminous roads," NBCA's executive director, H. K. Griffith, declared. "The further we are able to reduce maintenance costs, the more money there will be for new construction."

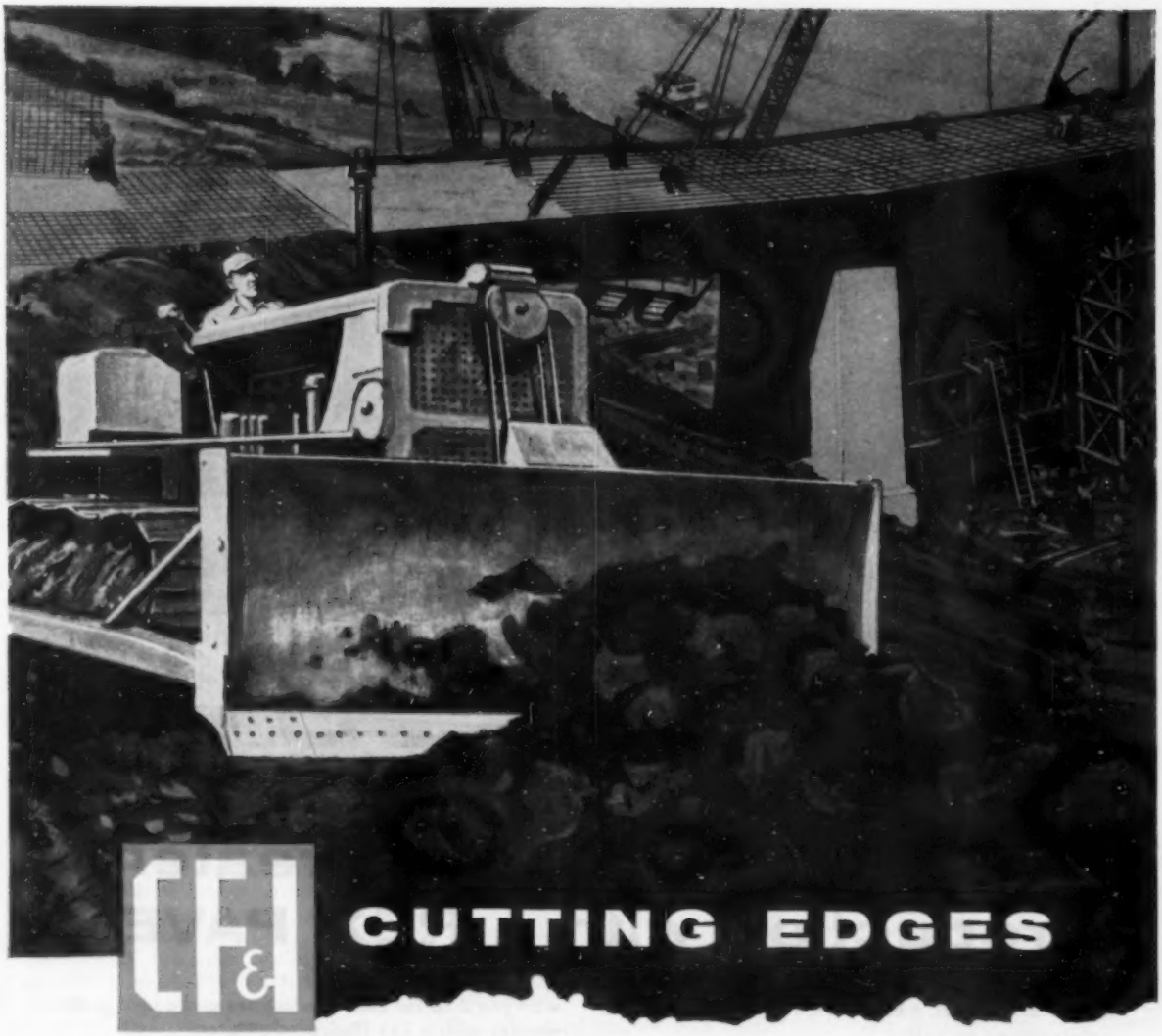
Salaries of state highway engineers have risen an average of 16% in the last two years, the American Road Builders Association reported last month. ARBA found, also, however, that salaries in most states are still lagging behind the minimums recommended by the American Association of State Highway Officials. Every state has made some salary increases in its engineer ranks since the last ARBA survey in 1956. And 29 states have boosted salaries in all grades. Copies of the comprehensive poll may be obtained from ARBA, 600 World Center Building, Washington 6, D.C. It covers all categories of engineers from rodmen to chief administrators, and includes the AASHO salary recommendations.

* * *

A thorough analysis of salaries of highway right-of-way men was issued last month by the Highway Research Board. The special report (No. 34) investigates various types of state highway department right-of-way organization, staff requirements and salaries. Salary-wise, the right-of-way man is low man on the totem pole. His median pay, nationwide, is $8,033, compared with $8,885 for maintenance engineers, $8,806 for construction engineers, $8,601 for bridge engineers, and $8,542 for design engineers. (Averages, of course, are far less.)

This is deplorable, the study implies, considering the strategic role of the right-of-way man at this stage of the National Highway Program, and particularly so in states where shortages of staff personnel have threatened to hold up construction programs. The right-of-way acquisition problem has increased in legal complexities as well as in volume. David R. Levin, chairman of HRB's Committee on Land Acquisition, points out that right-of-way costs exceeded the inflation in construction costs by a billion dollars in the 10-year period, 1946-56, and that no halt in this spiral can be discerned. Highway officials will put out $15 billion for right-of-way during the next 15 years, about $5.6 billion on the Interstate System alone.

Young men interested in becoming highway engineers will obtain sound guidance from a booklet just released by a joint committee of AASHO and ASCE. "A Career for You in Highway Engineering" describes the future needs of the industry and the challenging opportunities available in planning, location, design, construction, maintenance, traffic operations and research. The Automotive Safety Foundation has offered to reprint quantities of the very attractive publication at cost if there is enough interest among state highway departments, contractor associations and other roadbuilder groups. (Interested organizations should write directly to ASF, 200 Ring Building, Washington 6, D.C. for more information.)



CUT DOWNTIME

On earthmoving projects there is nothing more costly than lost time due to idle or poor equipment. Blade or cutting edge failures often result in work stoppage and higher costs, especially when replacement parts are not readily available.

To reduce blade failures, lower operating costs and improve profits, more and more contractors are using CF&I Cutting Edges. Made of special analysis steel, these rugged, dependable-service blades have the endurance and long-wearing qualities necessary to assure the greatest number of operating hours per dollar of blade cost.

CF&I maintains an inventory of more than 4000 cutting edge blueprints to meet your requirements. They are available in a variety of curved or flat sections, widths and thicknesses . . . produced to exact specifications for fast and efficient on-the-job installation. For complete details contact your nearest CF&I sales office.

CF&I CUTTING EDGES

4118-A

THE COLORADO FUEL AND IRON CORPORATION

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo
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on the level...

or working upgrade!

here's why you get greater production with a REX® PAVER

Faster on the level, a Rex has the production edge on uphill paving as well.

Every time you work upgrade, you set your Rex for transfer and discharge times to suit—short, medium or long!

Going uphill, a quick, simple adjustment speeds up the cycle time of your Rex. With the gravity assist of transfer and discharge, you set the paver for short time—with fast transfer through two large transfer chutes. Immediately, there's a 7.3% production boost over a medium setting. (On work where you use the medium setting, you also have faster operation with a Rex!)

There you have it. Going uphill doesn't have to slow down your yardage—not when you're operating a Rex! Only Rex has this quick *adjustable* transfer and discharge cycle advantage. Another of the many reasons why you'll be far ahead in batches and added profits per day with a Rex Hydrocycle Paver.

REX Hydrocycle Control has work-speeding advantages!

Amazing Hydrocycle literally "automates" the paver! Operator only sets batch meter and Hydrocycle's "hydraulic brain" takes over—controlling and operating the entire paving cycle. The human element is eliminated. There's no guesswork, *no guessing wrong—ever.* No wasted time. No operator fatigue—he stays alert and efficient, performing other functions better: traveling the bucket, swinging the boom, spreading the batch and moving the paver. Paving speed stays high all day long.

A Rex delivers the highest production—requires minimum of service.

See your Rex Distributor or write CHAIN Belt Company, 4652 W. Greenfield Ave., Milwaukee 1, Wis.

CONSTRUCTION REX MACHINERY

MOTO-MIXERS • BINS AND BATCHERS • BUILDING MIXERS • PUMPCRETE • RAILPORTER

CHAIN BELT COMPANY

PUMPS • PAVERS • SPREADERS • FINISHERS • FLOATS • CURING MACHINES • FORMS

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COVER SCENE

The Ektachrome color photograph on the cover of this issue shows a pair of C-362 Clipper saws as hooked up for cutting the center line joint on a Michigan road project. The job was on U. S. 78 near Lansing, Michigan; the contractor, Sargent Construction Company of Saginaw.

Sawing followed one week behind the paver. The first saw unit cut one-half of the depth, the second one completing the full cut of ⅛" x 1" dummy joint. Daily production ran about 4,000 lineal feet, using small diamond blades in a wet sawing operation. Roads and Streets staff photo.

Highway Bridge Design Competition

A steel highway bridge design competition offering 15 awards totaling $44,000 to engineers and college engineering students is being sponsored by American Bridge Division of United States Steel Corporation.

The competition is dedicated to the stimulation of the best use of steel in the design of bridges for interstate highways.

Open to professional and design engineers and to college engineering students, the competition poses the problem of designing an overpass structure in steel to carry a two-lane highway at right angles over a four-lane interstate highway on level ground. The overpass must be designed in accordance with AASHO standards entitled "Geometric Design Standards for National System of Interstate and Defense Highways."

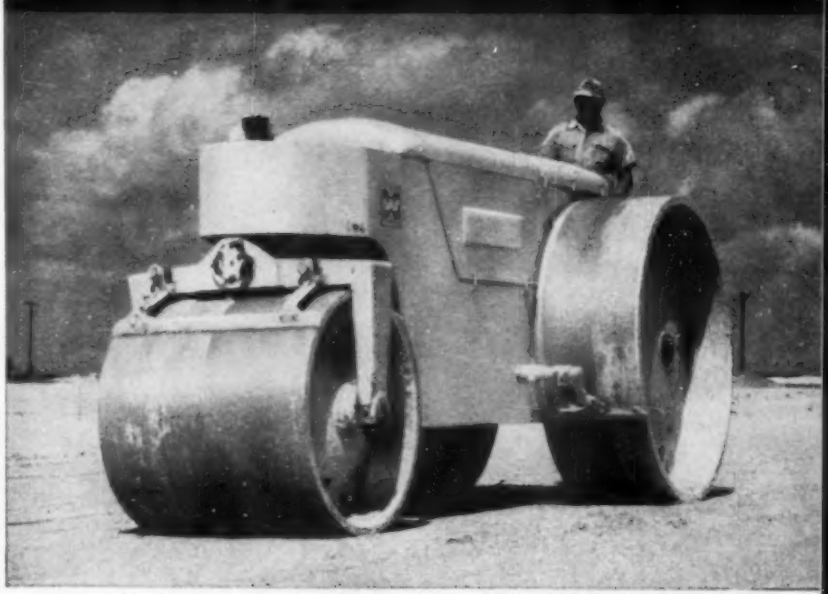
Eight awards will be made for winning entries submitted by professional and design engineers, including $15,000 top award, with a $10,000, a $5,000 and five $1,000 honorable mention awards.

College engineering students will compete for $9,000 in awards, the first award being $4,000. All entries will be judged on the basis of originality of design, utilization of the properties of steel, economy and appearance of the structure. The type of overpass structure, length of spans, and other factors will be left to the entrant's discretion.

Deadline for entering the competition is midnight, May 31, 1959. Entries should be mailed to the American Institute of Steel Construction, 101 Park Avenue, New York 17, N.Y.

HUBER-WARCO

3-Wheel rollers



torque converter for greater efficiency

The Huber-Warco 3-WHEEL ROLLER is a powerful, rugged machine built for economy, performance and durability. A combination of torque converter, tail-shaft governor and 2-speed transmission adds to the efficiency . . . doubles available power and supplies it instantly . . . cuts fuel consumption . . . maintains rolling speeds automatically at any set speed. Both standard and variable weight models are available. See your Huber-Warco distributor for complete details.

TANDEM ROLLERS

3-WHEEL ROLLERS

MAINTAINER

MOTOR GRADERS

Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

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HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.

☐ Send specifications on Huber-Warco 3-wheel rollers.

Send specifications on: ☐ Maintainer ☐ Motor Graders ☐ Tandem Rollers

Name _____

Title _____

Company _____

Address _____

City _____ Zone ____ State _____

11-RS

HUBER W WARCO

Want an easy-to-install drainage structure?

use Corrugated Metal

You don't need expensive handling or lifting equipment to install a Corrugated Metal Pipe Structure. The pipe comes in long lengths ready to lay, and since it is light and easy to handle, requires less time to install. For example, three men can properly install a 20′ length of Corrugated Metal Pipe in a matter of minutes. Corrugated Metal Drainage Products made from USS Galvanized Steel Culvert Sheets do not require "kid glove" handling. If dropped, they will not crack or spall. There are no losses due to breakage. Consequently, it is only necessary to order the lengths required to complete the job.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

Write for our free booklet "USS Culvert Sheets" which tells you how to get the kind of service you can expect from Metal Drainage Structures made from USS Galvanized Steel Culvert Sheets. It's loaded with information about selection of correct structure sizes, preparing foundations and installation procedure. For your free copy, write to United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark

Meetings

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS—Annual Convention, Sheraton-Palace Hotel, San Francisco, Calif.; Nov. 29-Dec. 2.

THE ASPHALT INSTITUTE—Annual Meeting, Sheraton Hotel, Washington, D.C.; Dec. 1-4.

HIGHWAY RESEARCH BOARD—Annual Meeting, Sheraton-Park Hotel, Washington, D.C.; Jan. 5-9, 1959.

AMERICAN ROAD BUILDERS' ASSOCIATION—57th Annual Convention, Dallas Memorial Auditorium, Dallas, Texas; Jan. 19-22, 1959.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.—Annual Meeting, Americana Hotel, Miami Beach, Fla.; Jan. 19-23, 1959.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS—Annual Meeting, Brown Palace Hotel, Denver, Colorado; Jan. 26-28, 1959.

ASSOCIATED EQUIPMENT DISTRIBUTORS—40th Annual Meeting, Conrad Hilton Hotel, Chicago, Ill.; January 25-29.

NATIONAL CRUSHED STONE ASSOCIATION—Annual Meeting, American Hotel, Miami Beach, Fla.; Jan. 26-30, 1959.

NATIONAL BITUMINOUS CONCRETE ASSOCIATION—4th Annual Convention, Americana Hotel, Miami Beach, Florida; Feb. 2-6, 1959.

County Roads Damaged During Tollway Work

Contractors engaged in the $441 million Illinois tollway project will be required to repair local highways damaged by their hauling and contruction equipment.

So announced the Cook County highway department recently. An arrangement submitted by superintendent William J. Mortimer calls for the toll road authority to cooperate by withholding 10 percent of the payment to contractors until repairs are made.

This arrangement applies only to highways under the jurisdiction of the county. Most of the highways damaged are bituminous surfaced roads that were not built for such heavy traffic. The repair is estimated to cost about $300,000.

HUBER-WARCO

motor graders

balanced weight and power

The Huber-Warco 6-D & 7-D MOTOR GRADER series has been designed with the right blend of weight and power to handle tough grading quickly and efficiently. A combination of torque converter, tail-shaft governor and power-shift transmission assures constant power at the blade for a greater work volume. Horsepower range of the Huber-Warco 6-D & 7-D MOTOR GRADERS is 100 to 150 h.p. Your Huber-Warco distributor would like to show you the many other features of these modern graders. Contact him today.

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Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.
Send me specifications on the Huber-Warco
☐ 6-D & 7-D series ☐ other motor graders
Send specifications on: ☐ Maintainer
☐ Tandem Rollers ☐ 3-Wheel Rollers

Name _____
Title _____
Company _____
Address _____
City _____ Zone ____ State _____

11-RS

HUBER W WARCO

Now 70% of all concrete highways are

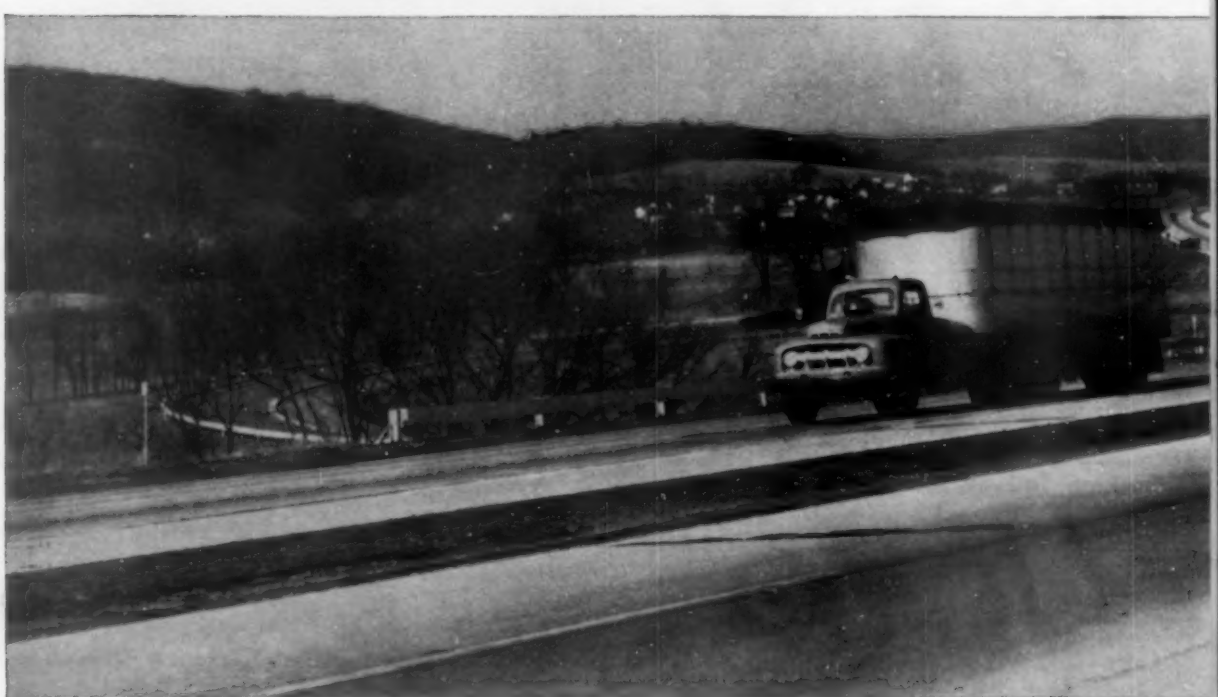
Steel reinforcement in portland cement concrete is now required for highway construction in 23 states. These 23 states account for more than 70% of all concrete highway construction!

HERE'S WHY:

Safer driving—Welded wire fabric reinforcement holds together the edges of hairline cracks which may appear in concrete slabs. It protects highways . . . prevents the appearance of dangerous and unsightly breaks in pavement. Adequately reinforced concrete roads provide smoother riding . . . safer driving for our motorists.

Longer road life—Highways last longer and require less maintenance when they are strengthened with quality steel reinforcement. American Welded Wire Fabric reinforcement adds 30% to the strength of concrete slabs. And it adds years of maintenance-free highway service.

Future traffic—The next few years will bring a tremendous increase in the traffic load on our expanding highway system. And roads will need, more than ever before, the extra 30% of strength that American Welded Wire Fabric adds to concrete slabs.



ALWAYS ASK, *"is it Reinforced"*

USS American Welded Wire Fabric

reinforced with steel !

HERE'S THE BRAND TO BUY:

American Welded Wire Fabric is made of *extra-strong* cold-drawn wire, electrically welded into a tough network of steel. Spacing is precise; joints are strong; and the product is rigidly inspected . . . quality-controlled from steel to finished fabric. Be sure your roads are built to last with American Welded Wire Fabric reinforcement. Send today for our new booklet: American Steel & Wire, 614 Superior Ave., N.W., Cleveland 13, Ohio.

USS and American are registered trademarks

THE INDIANA TOLL ROAD is *permanently* reinforced with American Welded Wire Fabric. American Welded Wire Fabric provides safety and long, dependable service for most of our other superhighways, too, including the Pennsylvania Turnpike, the New York Thru Way, the Ohio Turnpike, and the new Connecticut Expressway.

STEEL REINFORCEMENT is an important construction feature in most of America's new toll highways. American Welded Wire Fabric adds 30% to the strength of concrete slabs . . . provides permanent crack resistance . . . reduces the need for maintenance. And it's prefabricated for quick, easy installation. Whether you're building a turnpike or a city street, specify the finest in steel reinforcement—American Welded Wire Fabric.

American Steel & Wire Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

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you don't have to be

A BIG WHEEL TO KNOW . . .

. . . that "BIGNESS" alone does not get the job done!

The ability to coordinate equipment, skill and resources "builds" profitable performance records. It also takes specialized know-how and coordination to provide the bonds and insurance required by qualified contractors.

THE FIDELITY AND CASUALTY COMPANY OF NEW YORK continues, year after year, to keep pace with progress—providing all kinds of bonds and insurance—for all types of construction projects—in all parts of the world.

The Fidelity and Casualty Company of New York

"Writing Bonds Since 1876"

A Member Company of America Fore Loyalty Group

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Personals

DR. CLARK A. DUNN, of Stillwater, Oklahoma, has been elected president of the National Society of Professional Engineers. A professor of civil engineering and executive director, office of Engineering Research, Oklahoma State University, Dr. Dunn succeeds Garvin H. Dyer, of Independence, Missouri, as head of the 46,000-member engineering group. Dr. Dunn is a past president of the Oklahoma Society of Professional Engineers.

PAUL S. WRIGHT, a 34-year veteran of the Los Angeles department of public works, has been appointed commercial paving engineer for the Pacific Coast Division of the Asphalt Institute. He will serve under B. A. Vallerga, division manager.

MAURICE MARTIN has been appointed director of highways for Kansas by Governor George Docking. Martin, who is 44 years old has been acting director since the death of Lynn R. Brodrick in January, 1958. Martin was with the Federal Internal Revenue Service for 17 years before going with the highway commission as assistant to the director in 1957.

Ellis L. Armstrong and Elmo R. Morgan

ELMO R. MORGAN, vice president of the University of Utah, has been appointed to succeed Ellis L. Armstrong who has become Commissioner of Public Roads in Washington.

D. C. GREER, state highway engineer of Texas, has been named to the Advisory Council of the Yale University Bureau of Highway Traffic.

Membership on the Advisory Council offers leaders in the highway field a medium of service

(Continued on page 32)

Road Jobs Move Faster with Bucyrus-Erie Cranes...

Yours Can, Too!

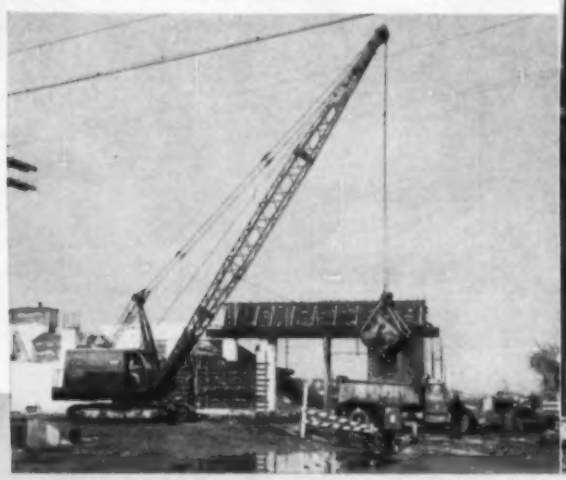
With Bucyrus-Erie cranes handling key jobs like those shown here, road jobs move along faster, mean bigger profits for contractors. Look over the jobs pictured . . . you'll see how important features helped these Bucyrus-Erie crane users handle tough jobs quickly and effectively.

You'll see why Bucyrus-Erie cranes are favorites of owners, operators, and maintenance men on road jobs wherever you go. And, most important, you'll see why you'll be ahead on your road jobs with Bucyrus-Erie cranes. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

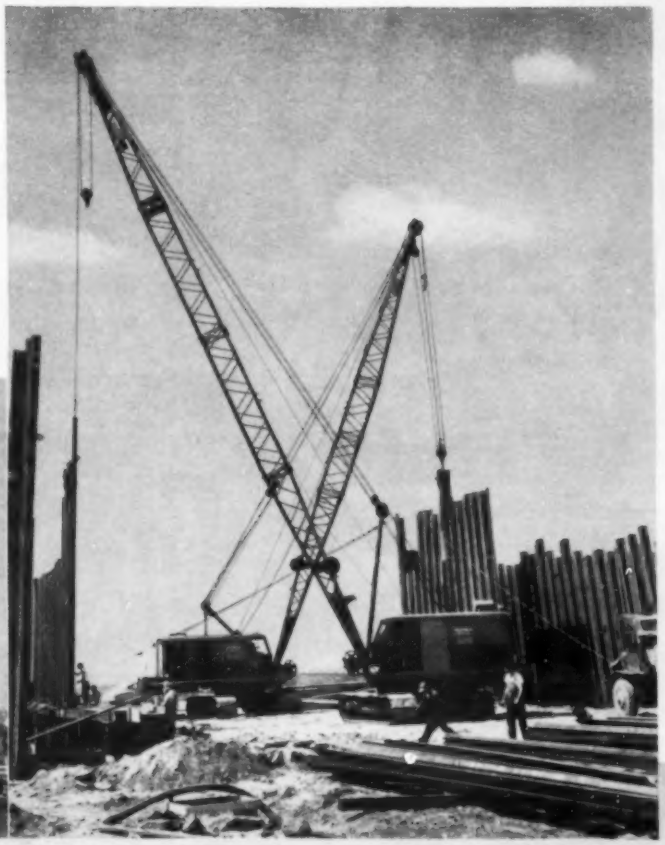
461E58C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress



Equipped with clamshell bucket, this 38-B crane moves earth in construction of approaches to the Indiana Turnpike near Hammond. The load-lift cycle is smooth, balanced, and coordinated to prevent overstressing of parts and excessive wear.



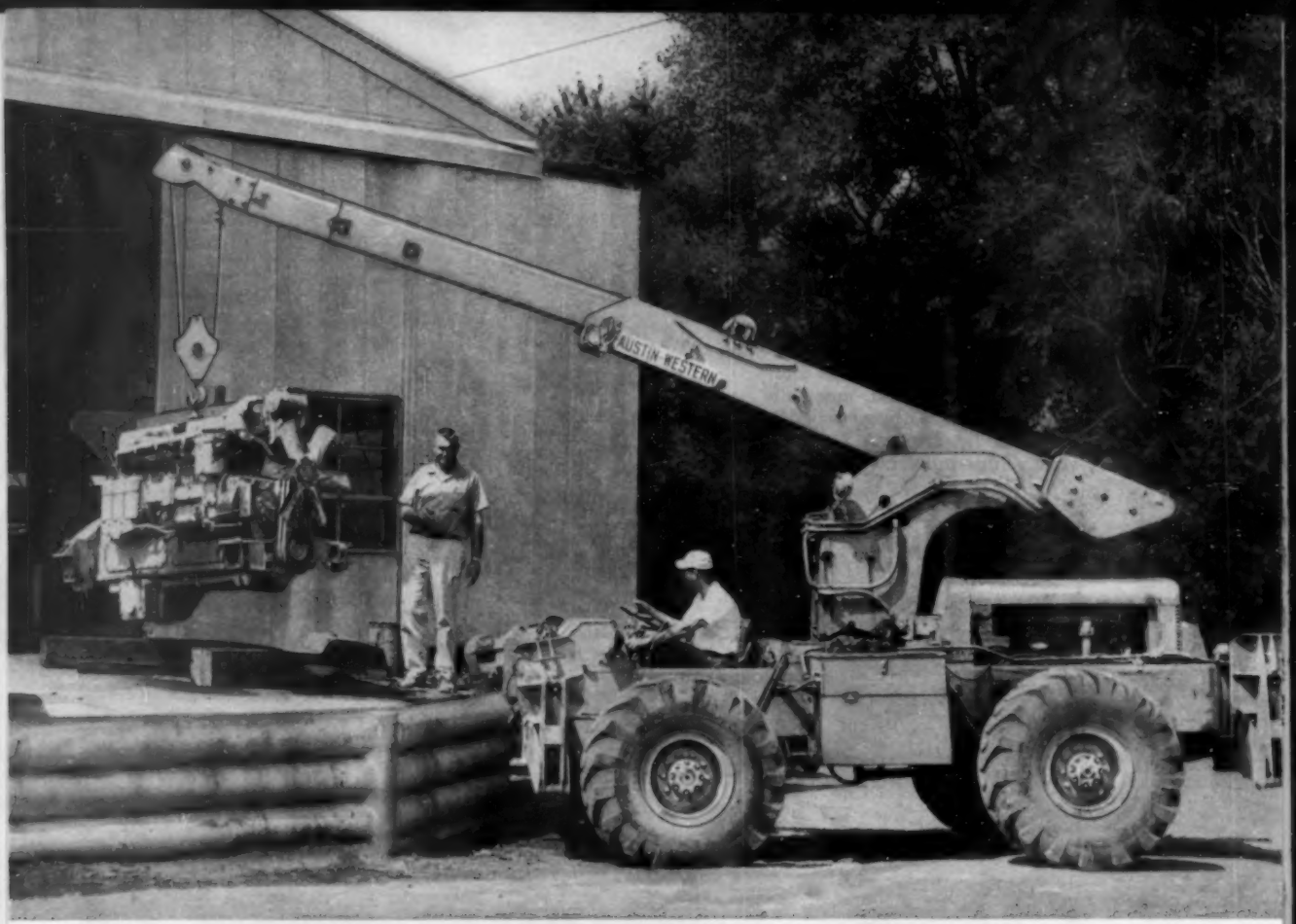
A 51-B and 54-B team up to drive pile on a section of the New Jersey Turnpike near New York City. A variety of boom lengths and jib extensions enables these machines to meet various job requirements.

. . for more details circle 251 on enclosed return postal card

A 54-B crane installs one section of a bridge lift system near Miami, Fla. Independent power controlled lowering boom hoist, standard on the 54-B, enables the operator to change boom angle at any point in the cycle — permits accurate placement of loads.

This 38-B crane with "headache ball" breaks up rock on the Massachusetts Turnpike near Blanford. The boom on this crane is of lattice-type construction for strength and light weight. Angle members are welded to the inside of chord legs so there are no obstructions on the outside of booms.

Reaching 160 feet, an 88-B crane erects steel for a highway bridge in southern California. The smooth, soft air controls permit easy, precise operation while retaining the feel of control for the operator. Also at work on the project are Bucyrus-Erie 22-B and 38-B cranes.



Austin-Western Hydraulic Crane is Ohio contractor's key materials handling unit

C. F. Replogle Co. serves the tri-state area of Ohio, West Virginia and Indiana as engineer and contractor, did close to a $10 million business in 1957. During the 1954 season, the company rented an A-W crane to assist in maintaining its $¾ million worth of equipment at its five central shops, in Circleville, Ohio. The crane soon proved itself invaluable, and Replogle decided to buy it. In addition to doing the heavy lifting on maintenance jobs, the crane serves the yard detail in handling cables, rollers, oil and other material.

The company tells us: "Everything in the maintenance yard and shops revolves around and depends on the use of this A-W crane. The shop foremen hate to see the crane rented out occasionally, as a favor to neighboring plants, because it requires a bit of planning to avoid interruptions of work, even for the small average of 3 hours a week that it can be spared. In summer it works nearly 16 hours per day. In winter it works about 8 hours per day.

"This unit has unlimited flexibility and turns from handling large crane boom sections in the yard to loading spools of wire on trucks, then to lifting an engine out of a machine. The precise hydraulic control saves time and avoids damage to valuable equipment during repairs."

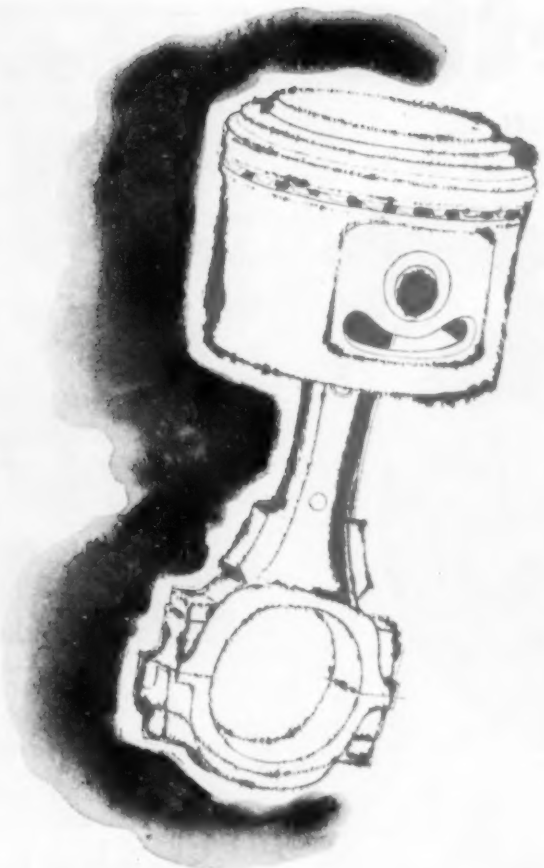
For the complete C. F. Replogle story, write for Certified Gould Report No. 5705.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

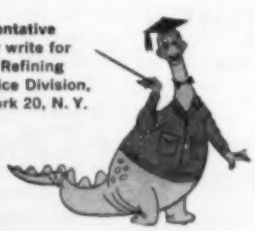
. . . for more details circle 240 on enclosed return postal card



Pistons... Oil... and How to Save Money

The longer your pistons work before need of ring replacement—the less your cost of operation. Sinclair Tenol® Oils have the reputation for giving longer service to cylinders, rings and other vital parts. Refill with Tenol now. Next time management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.



SINCLAIR
Tenol® Oils

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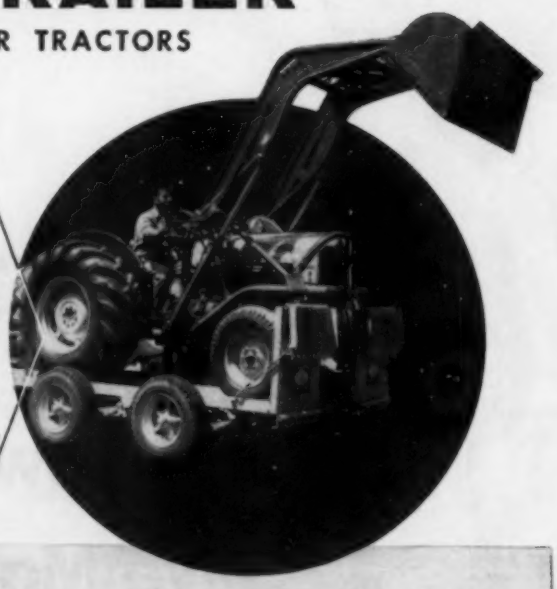
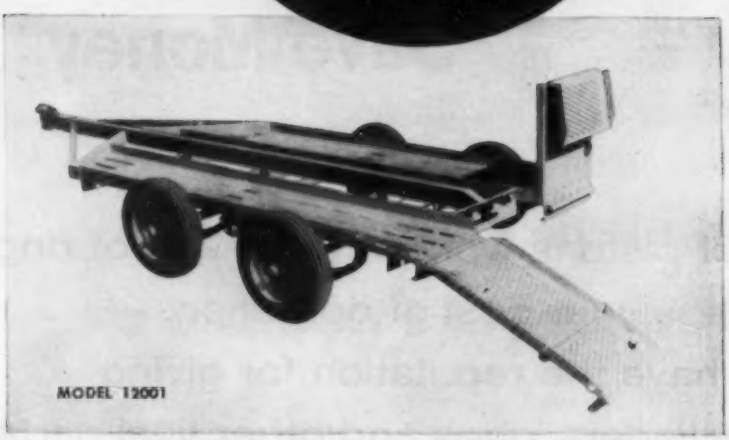
Haulette

THE ORIGINAL DRIVE-ON
TRAILER
FOR TRACTORS



FASTER
SAFER
LOADING &
HAULING

- *Saves time*
- *Saves money*



For Tractors, Light Construction and Farm Equipment

Equipment rides faster and safer on a rugged Haulette, so you save time and money. Users tell us that a Haulette soon pays for itself in man hours saved.

Simply set the brakes, lower the ramps, drive-on your equipment and you're ready to go faster and more safely on highways or rough country roads.

Only Haulette by Fayette has the patented Equalizer Bar design and true camber performance that assure no-sway towing.

If you use or sell tractors and light construction equipment, take the first step to money-saving efficiency . . . WRITE for complete Haulette descriptive literature and information on protected franchises.

HAULETTE DIVISION
FAYETTE MFG. CO.
MORENCI, MICHIGAN

Branches: Americus, Ga. • Commerce, Texas • Goshen, Ind.

FIRST AND FINEST FAYETTE ***IN THE FIELD***

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Personals

(Continued from page 28)

whereby they can inject their abilities into the research and teaching programs of the bureau, recognized as the outstanding school of its type in the nation.

Francis S. Friel

F. S. Friel Heads ASCE

Francis S. Friel, a consulting engineer of Philadelphia, has been elected President of the American Society of Civil Engineers for 1959. He heads Albright & Friel, Inc., consulting engineers. His firm has engaged in a wide variety of projects totalling over 2,000 in number and exceeding $1¼ billion in value during the past 27 years.

Roadside Property Owners Entitled to Damages

A decision threatening to increase the cost of highway building in the state, the Indiana Supreme Court held that roadside property owners which is not taken for roadbuilding are entitled to damages.

Written by Justice Frederick Landis, the opinion held that a property owner is entitled to collect damages for inconvenience caused by a road project even though his property is not needed for it.

The decision gave Geiger and Peters, steel fabricating firm authority to continue in Marion County Circuit Court its suit to collect $1,000,000 damages for "isolation" allegedly resulting from construction of the $8,000,000 Madison Avenue Expressway.

The opinion opened the way for an unparalleled extension of the state's damage liability along new highway routes. Heretofore damages in Indiana were limited to land actually acquired by the state for highway use under the right of eminent domain.

. . . and only straight Sterling Rock Salt gets right down to the pavement through ice or hard-packed snow!

What's behind the big trend to straight rock salt for ice control? The answer is that abrasives—even when mixed with salt—just can't produce the bare pavements so vital during winter storms!

Sand and cinders don't melt hard-packed snow . . . have no effect on ice, sleet and freezing rain. They give very limited traction because wind and traffic quickly scatter them to the side of the road. And what's left is soon covered by as little as ¼" more snow. Cleanup of abrasives is a costly, messy job, too.

In contrast, straight Sterling Rock Salt is a powerful *melting* agent. It helps turn snow into slush—quickly. When ice forms, salt crystals bore through to the road surface. Here, brine is formed and spreads out to break the bond between ice and pavement. Ice can be easily removed so you get a bare, safe pavement.

Other economies. One truckload of straight Sterling Rock Salt covers as long a stretch of road as 8 truckloads of abrasives. You make fewer trips to take care of a storm. And Sterling Rock Salt leaves *no* spring cleanup jobs. Now's the time to complete your stockpiling of Sterling Rock Salt. Winter demands can make deliveries uncertain. Contact your International representative or the nearest sales office.

FREE "BARE PAVEMENT MAINTENANCE" BOOKLET. Ask your International representative or write for your copy soon. It's an up-to-date, comprehensive guidebook on all aspects of ice control. Can be helpful in your winter program . . . whether it's municipal, county or state.

INTERNATIONAL SALT CO., INC., SCRANTON, PA.

SALES OFFICES:

Atlanta, Ga.	Chicago, Ill.	Memphis, Tenn.	Philadelphia, Pa.
Baltimore, Md.	Cincinnati, O.	Newark, N. J.	Pittsburgh, Pa.
Boston, Mass.	Cleveland, O.	New Orleans, La.	Richmond, Va.
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STERLING "Auger-Action" ROCK SALT

INTERNATIONAL SALT COMPANY, INC.

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...*New Curtiss-Wright Scraper Delivers 20% More than Rated Capacity!*

. . . The chart at right tells the story . . . Under difficult on-the-job conditions this Curtiss-Wright CW-226 *averaged* more than 5 yds. better than rated capacity . . . moved this load at money-making speed — dumped swiftly and evenly . . . This type of job-proven performance keeps cost-per-yard figures *down* — profit figures up! . . . Every piece of Curtiss-Wright construction machinery is built to *earn* its price many times over — see your distributor today for complete information on the CW-226 and the many other units in the Curtiss-Wright line!

THIS ON-THE-JOB PERFORMANCE REPORT TELLS THE STORY

MODEL CW-226

2-axle, self-propelled scraper designed for rated capacities of:

26.0 Cu. Yds. Struck
36.0 Cu. Yds. Heaped

Average Payload Hauled:	31.2 Cu. Yds.
Loaded Unit Speeds to:	38. m.p.h.
Average Loading Time: (with single pusher, less than top h.p. rating)	1 min., 30 sec.
(with tandem pusher)	50 sec.
Average Loads:	85,800 lbs.

SOUTH BEND DIVISION

CURTISS-WRIGHT

CORPORATION
SOUTH BEND, INDIANA

. . . for more details circle 261 on enclosed return postal card

New Publications

Year 'Round Concreting Pamphlet Available

An 8-page pamphlet entitled "Year 'Round Concreting" summarizes the new American Concrete Institute's standard recommendations for cold weather concreting. It tells how calcium chloride and other developments aid in placing durable, quality concrete in cold weather.

The publication includes sections on accelerators, preparation before concreting, winter concreting objectives, and protection required. A chart illustrates data on effect of 2% calcium chloride at temperatures of 73°, 55°, 40° and 25°F, on Type 1 and Type 3 cement. Guide specifications are included for architects and consulting engineers.

Copies of "Year 'Round Concreting—A.I.A. File No. 3-B-2," are available on request to the Calcium Chloride Institute, 909 Ring Building, Washington 6, D.C.

Calcium Chloride in Concrete, Manual Available

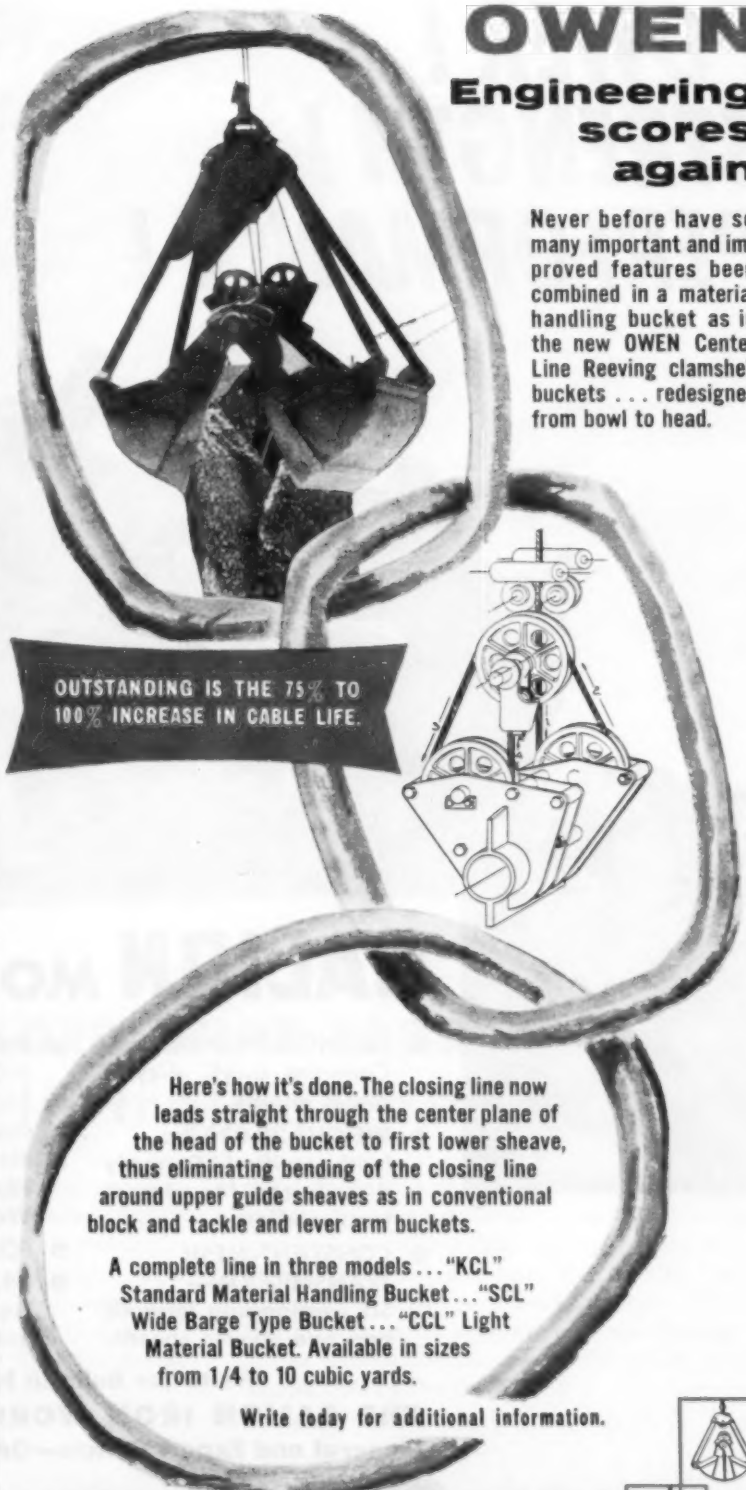
A 40-page technical manual on the subject "Calcium Chloride in Concrete" is available. It contains data on major effects of calcium chloride relating to its advantages on initial and final set, early strength, ultimate strength, cold weather protection and high early strength cement and air entrained concrete.

The data of technical nature includes the relation of calcium chloride to early strength, both compressive and flexural, ultimate strength, curing, workability and density, cold weather concreting and there is a section on calcium chloride versus extra cement.

Single copies are available immediately on request to the Calcium Chloride Institute, 909 Ring Building, Washington 6, D. C.

PHILADELPHIA CITY PLANNING COMMISSION, ANNUAL REPORT, 1957. The commission, with headquarters at Penn Square Bldg., 1317 Filbert St., Philadelphia 7, has issued this attractive 34 page illustrated booklet which quickly visualizes the elements of the program for the metropolitan area.

(Continued on page 40)



OWEN

Engineering scores again

Never before have so many important and improved features been combined in a material handling bucket as in the new OWEN Center Line Reeving clamshell buckets . . . redesigned from bowl to head.

Here's how it's done. The closing line now leads straight through the center plane of the head of the bucket to first lower sheave, thus eliminating bending of the closing line around upper guide sheaves as in conventional block and tackle and lever arm buckets.

A complete line in three models . . . "KCL" Standard Material Handling Bucket . . . "SCL" Wide Barge Type Bucket . . . "CCL" Light Material Bucket. Available in sizes from 1/4 to 10 cubic yards.

Write today for additional information.

The OWEN BUCKET Co.

BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

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POWER !
STRENGTH !
PERFORMANCE !

GALION MODEL 160

- 160 HORSEPOWER— Cummins 6-cyl., 4-cycle diesel engine.
- WEIGHS 30,020 lbs. (with scarifier)—Correctly distributed for utmost tractive effort.
- CONSTANT-MESH TRANSMISSION— Six overlapping forward and two reverse speeds.
- HYDRAULIC SHIFTABLE MOLDBOARD— 13' x 29" x ¾" for moving big loads.
- RUGGED BOX-TYPE FRAME— Weighs 134 lbs. per foot.
- FOUR-WHEEL BRAKES.
- 14.00 x 24 TIRES— Front and rear, interchangeable.

Write for Bulletin No. 421.

THE GALION IRON WORKS & MFG. CO.
General and Export Offices—Galion, Ohio, U. S. A.

GALION ESTABLISHED 1907

MOTOR GRADERS & ROLLERS

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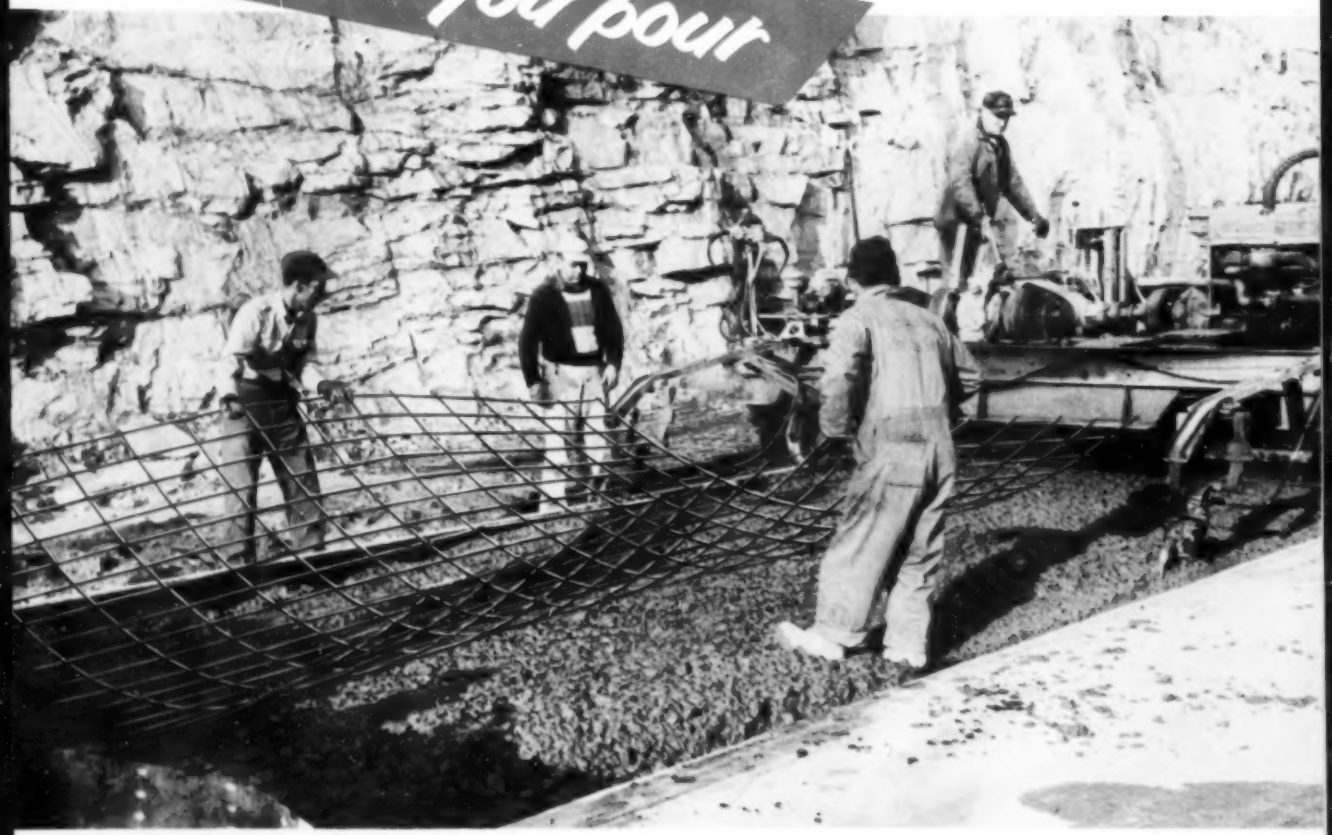
Before you pour



...add
CLINTON WELDED WIRE FABRIC
for built-in traffic-resistance

For long-lasting, trouble-free roads, nothing surpasses reinforced concrete. Reinforcement cushions the impact of heavy, fast-moving vehicles . . . holds cracking to a minimum by distributing load stresses over a wide area . . . helps concrete resist contraction and expansion caused by sudden temperature changes . . . and cracks that do appear are held tightly in check, preserving a smooth, solid road surface.

And Clinton Welded Wire Fabric is ideal for highway reinforcement. It is easy to install—it's economical—and its light weight means you also save on transportation costs. Clinton Welded Wire Fabric is available for fast, nationwide delivery, in gages, lengths and widths to meet every specification. For further information and quick order action, call your nearest CF&I Sales Office.

WHEN THEY ASK...

"is it Reinforced"

SAY YES...WITH CLINTON WELDED WIRE FABRIC

THE COLORADO FUEL AND IRON CORPORATION: DENVER • OAKLAND • NEW YORK

CF&I

Before you order

specify CLINTON WELDED WIRE FABRIC for...

maintenance-free concrete pipe

Maintenance-free pressure mains, highway culverts, sewer mains and drainage ditches are assured when you install reinforced concrete pipe. Reinforcement adds the strength of steel to concrete pipe . . . enables it to resist external loads and withstand internal pressure . . . holds cracking to a minimum.

Should a crack develop, the reinforcement holds it tightly closed, preventing dangerous and expensive leaks. Thus, it helps retain a smooth inner surface that offers minimum resistance to water flow.

Make sure the concrete pipe you install is reinforced. The use of welded wire fabric is more economical than other types of reinforcement, and assures a lifetime of maintenance-free service for concrete pipe. Top-quality Clinton Welded Wire Fabric is readily available in all popular gages, lengths and widths, in both the East and West. For further information, call your nearest CF&I Sales Office listed below.

WHEN THEY ASK...

"is it Reinforced"

SAY YES...WITH

CLINTON
WELDED WIRE FABRIC
THE COLORADO FUEL AND IRON CORPORATION

CF&I

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston • Kansas City Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita
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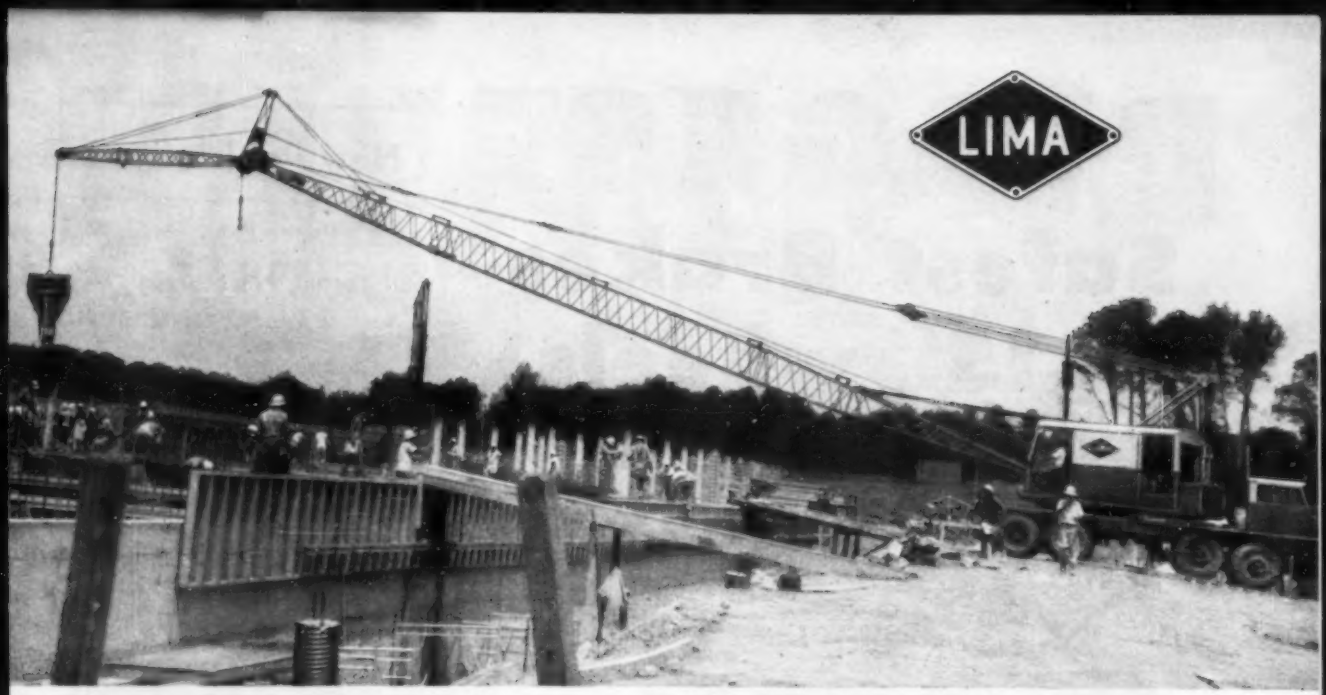

New LIMA 64-T Truck Crane with 100' boom and 30' jib reaches out almost horizontally to pour concrete on foundation job.

LIMA 64-T . . . new 50-ton truck crane.

New LIMA 64-T Truck Crane combines high capacity, long reach, low weight

The 64-T Truck Crane with 50 ton rated capacity is the latest addition to the long line of dependable, high performance LIMA cranes. The 64-T is completely designed and built, from the ground up, by LIMA. The latest developments in high strength steels are utilized to combine high capacity and long reach, with low weight. The main frame and components of the 64-T carrier is of "T-1" steel (100,000 psi yield strength).

Goes anywhere truck can go

Mounted on 12 heavy duty tires, the LIMA-designed 8 x 4 (rear drive) or 8 x 6 (front and rear drive) carrier will go anywhere a truck can go, on-or-off highway, at speeds up to 25 mph.

The LIMA Type 64-T Truck Crane will raise a 150-ft. boom, plus 30-ft. jib (180'-0" total), from the ground without auxiliary aid.

Gantry can be lowered to cab height while boom is suspended. Rear counterweight, pin connected front and rear outrigger boxes and beams are easily removed to reduce road weight. Hydraulic power steering, precision air controls and air brakes insure easy operation to reduce operator fatigue and produce top performance.

Versatile LIMA Cranes

LIMA cranes—capacities to 110 tons crawler mounted and 70 tons rubber mounted—are highly versatile. Interchangeable front ends make them adaptable to almost every job; they can be used as cranes, shovels, draglines or pullshovels.

Learn now why LIMAS are the choice everywhere for rugged, dependable performance! See your nearby LIMA distributor or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

5839

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

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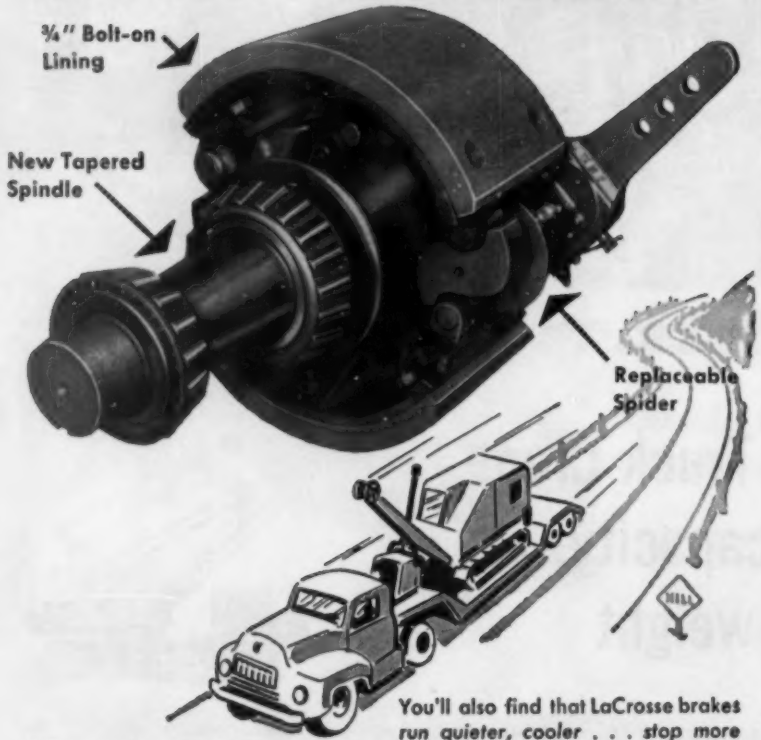
BIGGEST

Safest Brakes on 15" wheels!



When you have to STOP a heavy trailer load barreling down a steep grade, that *EXTRA 52 sq. in. of braking surface* you get on a LaCrosse tandem axle trailer, can mean the difference between life and serious injury — to men and to the equipment being hauled!

Remember, every LaCrosse-engineered trailer brake measures 12¾" x 6" wide — ½" *wider than any competitive lining used with 15" tires.* This means 13 sq. in. more lining per wheel — 52 sq. in. of extra safe braking area on every LaCrosse 4-wheel trailer.

You'll also find that LaCrosse brakes *run quieter, cooler . . . stop more smoothly.* Reason? Special exclusive S-cam design, with worm-gear slack adjusters and direct chamber-to-axle mounting. Linings are tough ¾" bolt-on type, which *outlast ordinary lining 45%,* according to owner records. In addition, LaCrosse now gives you removable bolt-on brake spiders, for quick, economical field replacement as needed—another important advantage found only on LaCrosse.

For free literature describing ten other exclusive LaCrosse advantages, write: LaCrosse Trailer Corp., Gould St., LaCrosse, Wis.

LC-33

Heavy metal fabrication since 1865

LaCROSSE

. . . the low-bed backed by a 1-year warranty

. . . for more details circle 286 on enclosed return postal card

New Publications

(Continued from page 35)

Soil Testing Procedures

A major reference on the subject of soils testing is off the press. Entitled "Procedures For Testing Soils", it is a 544-page paperbound book sponsored by Committee D-18 on this subject for soils for engineering purposes, under the American Society For Testing Materials.

This comprehensive report covers nomenclature and definitions, standard methods, and suggested methods in one of the most complete references ever compiled on this subject. This price $6.75, or $5.40 to ASTM members, remitted to the American Society For Testing Materials, 1916 Race St., Philadelphia 3, Pennsylvania.

E. B. CAPE is elected president of the Texas highway-heavy branch, Associated General Contractors. He is president of Gulf Bitulithic Company, Houston, and has held national offices including the vice presidency, contractors division, American Road Builders Association.

L. P. GILVIN is elected vice president of the Texas A.G.C. group. He is president of Gilvon-Terrill, Inc., contractors of Amarillo. Mr. Gilvin is a board member of the National Bituminous Concrete Association.

Solving Drainage Problems

Manufacturers of corrugated steel riveted culvert pipe, as well as designers, engineers and others who must plan and execute installations where drainage and loading problems are encountered, will be interested in and find useful the second edition of Bethlehem Steel Company's booklet, "Solving Drainage Problems," just off the presses.

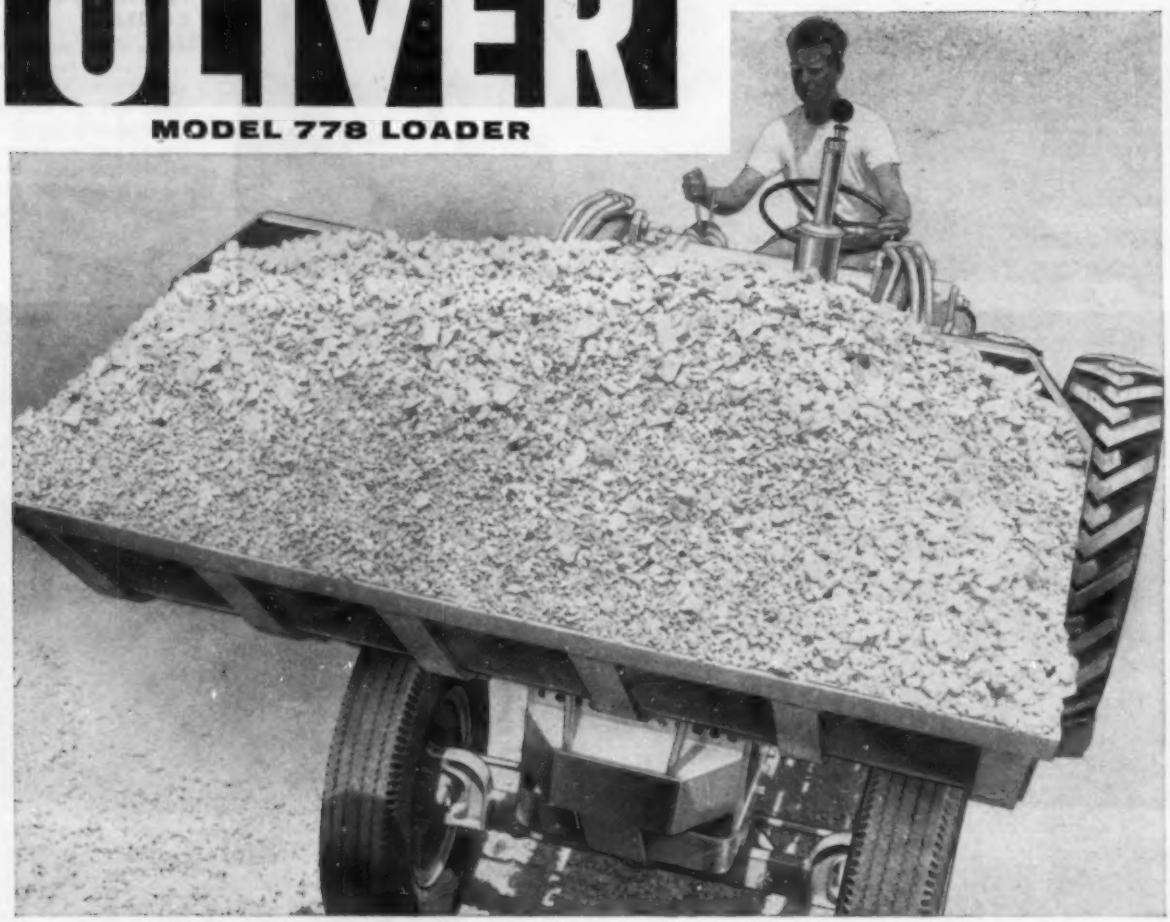
To be had free by writing to Bethlehem's Publications Department, Bethlehem, Pa., this 76-page illustrated brochure contains, in addition to a wealth of descriptive information, charts and data, new tables for the evaluating of flow friction that will greatly simplify planning and design under most conceivable conditions.

Bethlehem Steel is not a fabricator of culvert pipe but *is* the producer of a special copper-bearing steel—Beth-Cu-Loy—which has

(Continued on page 44)

OLIVER

MODEL 778 LOADER



Want loads like this...every time, in quicker time?

Your head will turn so fast to watch this new Oliver 778 loader in action that you'll *know* loading costs are in for a tumble!

Advanced design does it! The 778 loader is the newest of new tractor-loaders—giving you "things to come" in wished-for operating speed, ease and stamina.

"Reverse-O-Torc" does it! Another reason this modest-priced tractor-loader gives you production equal to much higher priced 4-wheel drive units of similar capacity. No gear shifting...no clutching. A flick of the lever gives you forward or reverse instantly. A torque converter with fluid coupling does the power transmission work—smoothly, positively.

Non-tiring operation does it! The most practical application of hydraulics and the most simple controls keep operators performing at peak efficiency even in day-long, nonstop production loading.

Step into your Oliver distributor's for the details and a demonstration.

It moves faster, loads more. The most spirited performance you ever saw in the ¾-yd. rubber-tired tractor-loader. The Oliver 778 is built to back up this speed for years. It's full-framed—the loader is mounted front and back for maximum strength. New detent valve feature holds lift arms up or down...new float position allows bucket to follow ground contour with no digging-in...bucket leveler is automatic. Works with many other attachments and in combination with trencher.

OLIVER **THE OLIVER CORPORATION**

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

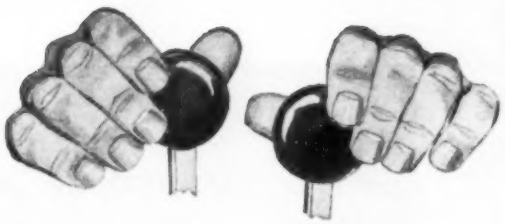
. . . for more details circle 296 on enclosed return postal card

FEATHER-TOUCH CONTACT

As the TD-24 pusher approaches the Payscraper, operator slows tractor speed *with one hand* by power-shifting planetary system; and by depressing the foot decelerator. He gets feather-touch contact without declutching, brake-riding, or throttle change!

HIGHER REVERSE

Operator uses decelerator pedal to slow engine at end of pusher run, permitting faster reverse shifting. Fast reverse speeds, coupled with power-shifted planetary steering system, allows TD-24 operators to reposition pusher extra fast and reduce scraper pick-up time.

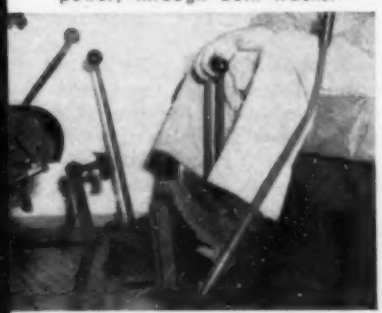


Your operators have fingertip control of greater push-loading profits because...

PLANET-POWERED "24's" beat other rigs on all four steps of the push cycle!

"CONSTANT CONTACT" LOADING

Releasing foot decelerator instantly applies full power, for efficient loading. Power-shifting either track into high range maintains solid pusher contact on curves—applies TD-24's full power, through both tracks!



GEAR HIGHER KICK-OUTS

Once scraper is fully loaded, the TD-24 *follows through* as operator power-shifts on-the-go with one hand to higher gear range, boosting speed of both units 27%. This allows most scrapers to come out of the cut a gear higher.

Your push-loading profits are in your operator's hands. And your operators know they can load out more scrapers every shift when their hands control the boss of the borrow pit—the International TD-24 crawler. The four-step pusher cycle (shown) pinpoints reasons why your operators and TD-24 pushers can increase production with easier control—from contact through kick-out.

Only the TD-24 gives you this big difference in pushers: more productive effort at the fingertip command of your operators! Exclusive Planet Power steering lets your operator: 1) keep pusher speed matched to that of the scraper; 2) power shift either or both tracks up or down a full speed range with a mere flick of the finger; and 3) apply full power to both tracks even if scraper cut is made on a curve.

And your TD-24 operators can fully utilize the decelerator pedal to cut maintenance costs three ways. The decelerator reduces engine clutching; eliminates brake pedal riding for steering; and permits feather-touch scraper contact without slam-bang jarring of operators and machines.

Get all of these TD-24 features that cut the cost of loading out paydirt, with either a Torque Converter or gear-drive tractor best suited to your needs.

If you're a dirtmover, get the TD-24 stay-on-the-job story by checking with any of the thousands of owners. Ask about the comparative life of such important components as track rollers and rails, engine, transmission, and planetary steering system. Get a TD-24 on your job today by calling your International Construction Equipment Distributor for a demonstration. Then you'll see how the TD-24 earned the right to be called "Boss of the Borrow Pit."

International® Construction Equipment

International Harvester Co., 180 North Michigan Avenue

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

. . . for more details circle 283 on enclosed return postal card

This tough, rugged chain tape is justifiably called a "drag tape". It withstands the rigors of daily field use in all kinds of terrain. It outlasts most other tapes because . . .

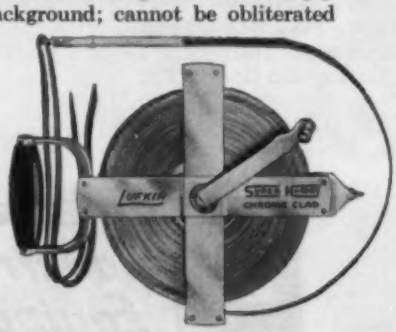
It Has Raised Markings and protective borders that are a part of the actual tape and will last as long as the tape itself.

The Line Is 5/16" Wide of special analysis steel that resists kinking and breaking.

It Is Chrome Clad®, an all-metal finish. The line is built up with a series of electroplatings, with a final hard satin-chrome finish that is resistant to abrasion, rust and corrosion.

It Is Easier To Read. The raised markings stand out sharply against the jet-black background; cannot be obliterated by mud and dirt.

The SUPER HI-WAY Drag Tape is furnished in 100, 200 and 300 foot lengths, either with or without reels. Two leather end thongs and a chainman's conversion rule are supplied with each tape. Choice of three styles of end markings.



THE LUFKIN RULE COMPANY
TAPES • RULES • PRECISION TOOLS
SAGINAW, MICH. • MIDDLETOWN, N.Y. • BARRIE, ONT.

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New Publications

(Continued from page 40)

found wide acceptance as the perfect steel for corrugated culvert service. The booklet, while it points out the advantages of Bethlehem's product, also calls attention to the many advantages of corrugated sheet steel over more rigid materials in the manufacture and installation of drainage culverts, such as long life, ease of fabrication and handling, low relative cost, and other important factors.

NON-SKID ROAD SURFACE TREATMENT. Bulletin No. 184, Highway Research Board, 2101 Constitution Ave., Washington, D. C. $0.50 per copy.

Covering two papers given at the last annual meeting of the board, this bulletin describes testing of a new skid-resistant treatment based on thermosetting epoxy resins; and another research involving service testing of a similar treatment of a concrete apron and toll booth area on Connecticut's Wilbur Cross Parkway. A good safety record at this location testified to the effectiveness of the measure in checking skidding.

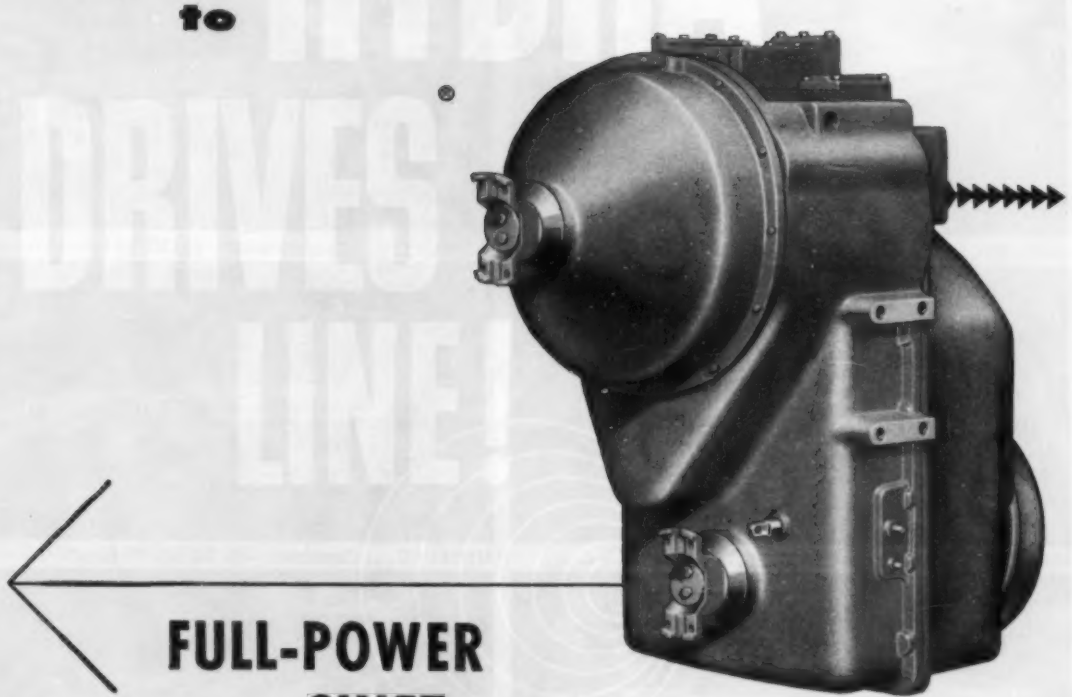
TESTS OF ENERGY-ABSORBING TRAFFIC BARRIERS, Bulletin 185. Price, $0.60. Highway Research Board, 2101 Constitution Ave., Washington, D.C.

This bulletin contains two papers sponsored by the Committee on Guardrails and Guide Posts, as presented at the Board's 36th Annual Meeting. The data in one pertains to hedges, and in the other to corrugated concrete slabs installed as a collapsible barrier.

PRESTRESSED CONCRETE PAVEMENT RESEARCH, Bulletin 179. Price: $1.20. Highway Research Board, 2101 Constitution, Washington, D.C. Contains three papers presented at the HRB 36th Annual Meeting.

ALLOCATING HIGHWAY COSTS RESPONSIBILITY. Bulletin 175, Highway Research Board, 2101 Constitution Ave., Washington, D.C. Price $1.20. Contains reports on studies in five states, as presented at the board's 36th annual meeting. Valuable data for the highway planner and administrator.

new addition to



FULL-POWER SHIFT TRANSMISSIONS now available for equipment of from 60 to 175 h.p.

Rockwell-Standard's new model Hydra-Drives *Full* Power Shift Transmission is now available in sizes especially designed for smaller installations, such as front end loaders, fork trucks, scrapers, crane carriers, rubber tire tractors and military vehicles. A single compact package combining torque converter and 4-speed, *all power shift* transmission, the Type BDB Transmission puts power to work smoothly, efficiently and economically.

HYDRA DRIVES
ROCKWELL-STANDARD CORPORATION
TRANSMISSION AND AXLE DIVISION
DETROIT 32, MICHIGAN

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Only the Hydra-Drives BDB offers all these major advantages:

4 Speeds Forward and Reverse. All Power Shifted! Provides for maximum horse power to load under all load conditions.

Easier Servicing and Maintenance. Fewer moving parts and bearings. Simple, rugged countershaft design and spur gears simplify maintenance.

Full Disconnect provides for split drives and makes it easier and safer to tow.

Dual Reduced Speed Pump Drives can be driven at engine speed or 4/5 engine speed for longer pump life and increased horse power to load.

Integral Design. Torque converter, transmission, oil passages, valving and oil sump are in one compact housing. Package is less bulky... up to 7¾ inches shorter than comparable models. Provides easier installation and less maintenance.

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TRAILMOBILE'S COMPLETE LOW-BED LINE OFFERS YOU JUST THE RIGHT TRAILER FOR EVERY APPLICATION

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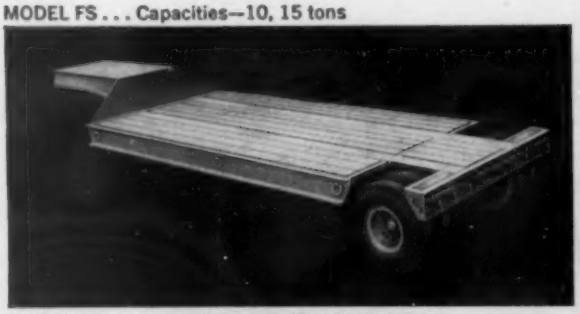
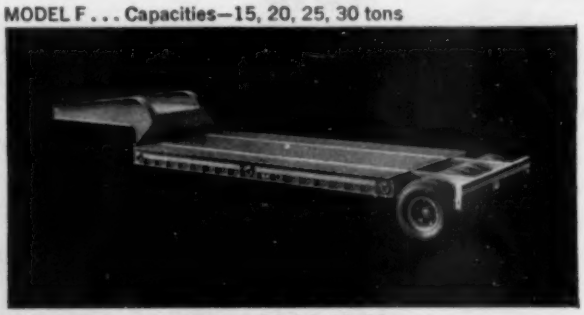
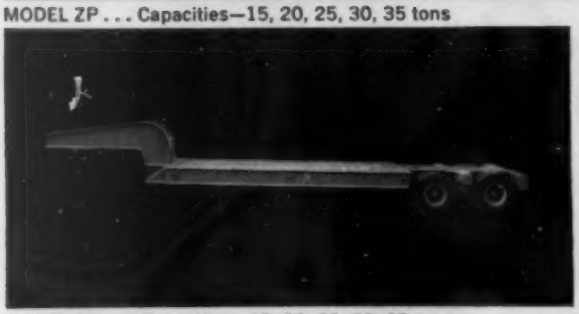


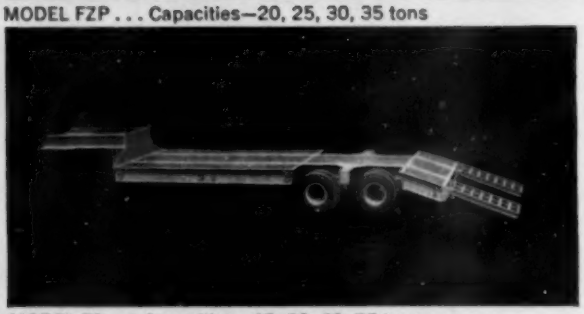
MODEL F . . . Capacities—15, 20, 25, 30 tons



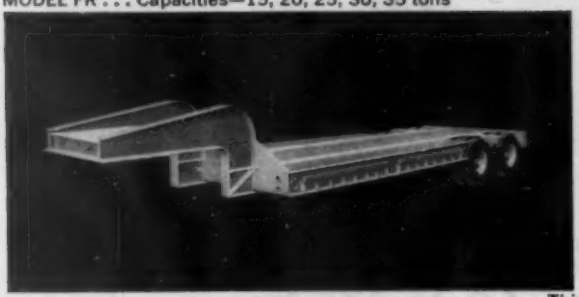
MODEL ZP . . . Capacities—15, 20, 25, 30, 35 tons



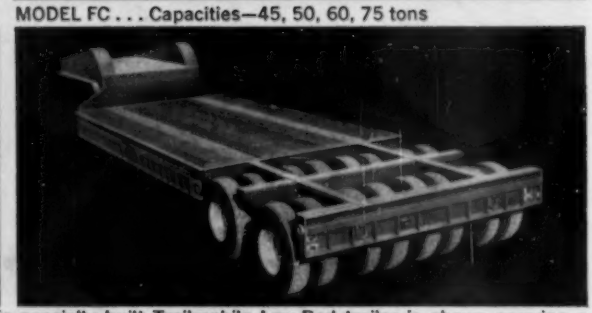
MODEL FZP . . . Capacities—20, 25, 30, 35 tons



MODEL FR . . . Capacities—15, 20, 25, 30, 35 tons



MODEL FC . . . Capacities—45, 50, 60, 75 tons



EVEN 182 TONS . . .

This specially built Trailmobile Low-Bed trailer is shown carrying a generator stator weighing 365,000 pounds. This is typical of the many types of units that can be engineered to meet special requirements.

TRAILMOBILE INC.

CINCINNATI 9, OHIO • SPRINGFIELD, MISSOURI • LONGVIEW, TEXAS • BERKELEY 10, CALIF.

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Paving Types Allocated For Michigan Interstate

Michigan's $1,250 million 5-year road program involving four lane divided highways has reached the stage where the department engineers have estimated the yardage of pavement of different types to be used.

Concrete will probably be used for more than 900 miles with 22.6 million square yards of p. c. Concrete involved. Asphaltic concrete has been selected for 192 miles, with 1,244,000 tons of mix anticipated.

This estimate has been announced in advance according to Commissioner John C. Mackie so that industries and contractors can lay plans for meeting demand over this period. "The department has made the announcement after a detailed engineering study based on consideration of cost, sources of aggregate, cement, borrow, soil and water conditions and possible ultimate strengths," said Mackie.

Portland cement concrete is to usually consist of a 9-in. slab on a 14-in. base including 3 in. of selected sub-base immediately under the pavement.

Flexible pavement design is based on 460 lb. per sq. yd. of asphaltic concrete with an 8-in. base of 40-50% crushed material, 3 in. of selected sub-base and 25 in. depth of sand or granular material.

Relatively long segments of highway for the various interstate routes have been selected for one type or the other, although some of the routes will be paved partly with one type and partly with the other.

Owner-Operator Ruling

The U. S. Department of Labor has ruled that owner-operators of trucks and the operators of other vehicles on construction projects, which are subject to the provisions of the Davis-Bacon Act, assume the status of employees for the purposes of the Act. The owner-operator may be considered an independent contractor by the prime contractor but this would not preclude the payment and reporting of the minimum wage required under the scale predetermined for the work.

Quarries opened for and furnishing material to a covered project, without regard to their location, are covered by the Act. On the other hand, commercial plants furnishing materials to others as well as a covered project do not come under the Act.

Put trench spoil off the road —the 80W will pull it back

Keep traffic lanes clear, put your spoil off the pavement. The Cleveland 80W backfiller pulls spoil from opposite side of trench, backfills *toward* itself, works parallel to trench and to traffic.

As it backfills, the 80W simultaneously compacts fill, the right way, from the bottom up. Leaves no voids around pipe—no settling, now *or* later.

Result: a clean, safe, *completed* job.

The 80W backfills *away from* itself, too. Stays off lawns, sidewalks and completed work.

Fits *all* job conditions.

The CLEVELAND TRENCHER Co.

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Good Everywhere

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Another Caterpillar Improvement That Lowers Maintenance Time and Costs

—NEW DRY-TYPE AIR CLEANERS FOR THE DW20 AND DW21!

The engine's worst enemy, air-borne dust really takes a licking from the new Caterpillar dry-type air cleaner, now standard equipment on DW20 and DW21 Tractors. Another of many earthmover features developed under Caterpillar leadership, this new cleaner not only slashes maintenance time and costs, but also increases engine efficiency and life. For example:

MORE EFFICIENT! New dry-type air cleaner removes 99.8% of all dirt in intake air, where oil-bath cleaners normally remove only 95 to 98%. In addition, effectiveness of the new dry-type unit is *constant* at any engine RPM, is not adversely affected by temperature changes or oil that needs changing.

This constant efficiency means that the most serious thing that can happen is reduction of air capacity—and temporary loss of engine power. But dirt *does not* get through into the engine. Excessive black smoke is an immediate visual reminder that HP is decreasing and that the cleaner needs servicing.

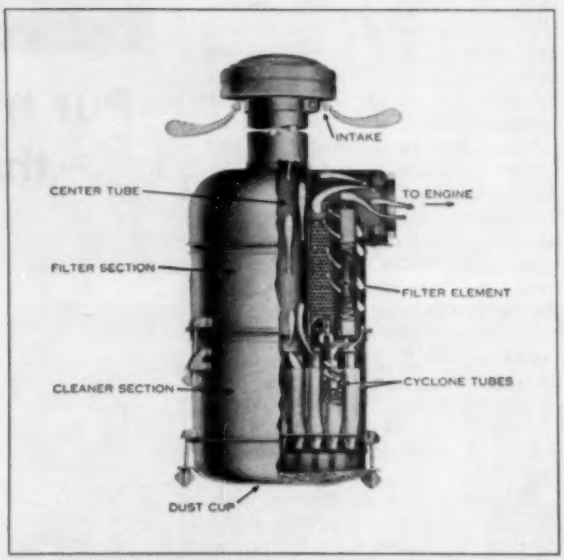
EASIER TO SERVICE! Both dry-type and oil-type cleaners should be serviced at intervals depending on dust conditions. But with the dry-type all that's required is removing the pan and emptying the dry material—a matter of 5 minutes, as against 20 minutes it usually takes to service the often messy oil-type. There's 15 minutes *more* for production at each service period!

MORE ECONOMICAL! The paper filter element can be cleaned easily and reused several times making replacement costs lower than the sum normally spent for oil to service the oil-type. Servicing is also faster, reducing labor costs.

Here's proof again that Caterpillar is the leader in *lowering* earthmoving costs. For complete information on the new dry-type air cleaner in Cat DW20 and DW21 Tractors, see your Caterpillar Dealer!

FIND YOUR CATERPILLAR DEALER IN THE YELLOW PAGES

. . . for more details circle 254 on enclosed return postal card



HOW THE DRY-TYPE AIR CLEANER WORKS

Operation of this moisture-proof unit is simple. Air enters it through the stack cap and passes through the center tube. The cap has a 14 x 14 mesh which removes most large, troublesome particles. From the center tube the air passes through the cyclone tubes.

These cyclone tubes swirl the air causing the heavier particles of dirt to drop out by centrifugal action through the funnel section into the dust cup. The relatively clean air then passes to the resin impregnated paper filter. This removes the remainder of the dirt. After passing through it, the air moves to the intake manifold of the engine.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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NEW DRY-TYPE AIR CLEANERS FOR GREATER EFFICIENCY AND ECONOMY!

Contracting Management

What Happens—

When A Bid Is Unbalanced?

An unbalanced bid sometimes may work against the contractor, as this "case example" demonstrates. An increase in the quantities that were bid low, made by work order as the job progresses, is one of several possible factors to consider.

By R. L. Puerifoy

Professor of Construction Engineering, Texas A & M College, College Station, Texas

What is an Unbalanced Bid? When an estimate is prepared for bid purposes for a project involving unit cost payment for work performed, the bid may be unbalanced. This is accomplished by increasing the cost of some items and decreasing the cost of other items when compared with the true costs of the respective items. Usually the engineer who prepares the plans and specifications for the project will specify the approximate quantity of each unit of work to be performed, such as cubic yards of earth or rock, acres of clearing, cubic yards of foundation course, etc. Sometimes the actual quantity of units may vary considerably from the quantity estimated by the engineer.

The total estimated cost for a project, based on submitting a balanced bid, is obtained by multiplying each specified number of units by the estimated cost of performing that unit of work, then totaling the separate costs in order to obtain the total cost for bid purposes. Since a contract is awarded on the basis of the total cost, as reflected in the bid, it is obvious that if the unit costs of certain items are increased the unit costs of other items must be reduced sufficiently to produce a total cost which is competitive.

Professor Peurifoy is the author of two books ESTIMATING CONSTRUCTION COSTS and CONSTRUCTION PLANNING, EQUIPMENT AND METHODS, published by the McGraw-Hill Book Company.

● *Why Are Bids Unbalanced?* If the quantities estimated by the engineer prove to be essentially correct, the total amount of money paid to a contractor upon completion of a project will not be altered appreciably by unbalancing a bid. Why then are bids unbalanced? There are several reasons, including the following:

1. If the unit cost of items of work to be completed first are increased, the contractor who is short on operating money may be able to finance his costs from money paid to him during construction.

2. If there is evidence that the actual quantities of units for one or more items will be appreciably greater than the estimated quantities, a contractor can increase the total amount of money paid to him by increasing the cost of those items which will be greater, and reducing the costs of those that will be less than the quantities given in the engineer's estimate. This condition produces a financial advantage to the contractor and a disadvantage to the owner.

3. A bid may be unbalanced to keep other con-

TABLE 1. RESULTS FOR A BALANCED BID

Estimated quantity	Unit	Description	Units completed this month	Per unit			Total per month		
				Bid price	Immediate cost	Receipts	Expense	Receipts	Surplus
200	Acres	Clearing and grubbing	40	$100.00	$85.00	$90.00	$ 3,400	$ 3,600	$ 200
120,000	Cu. yd.	Earth excavation	60,000	0.36	0.31	0.32	18,600	19,200	600
86,000	Cu. yd.	Rock excavation	20,000	1.80	1.53	1.62	30,600	32,400	1,800
65,000	Yd. qtr.	Overhaul	16,000	0.02	0.017	0.018	272	288	16
18,000	M. gal.	Sprinkling	4,500	1.60	1.36	1.44	6,120	6,480	360
1,600	Hr.	Rolling	400	10.50	8.94	9.46	3,570	3,784	208
1,260	Lin. ft.	36 in. concrete pipe	320	12.80	10.88	11.52	3,482	3,687	205
65,800	Cu. yd.	Foundation course	None	1.46	None	None	None	None	None
Total							$56,050	$69,439	$3,389

TABLE 2. RESULTS FOR AN UNBALANCED BID

Estimated quantity	Unit	Description	Units completed this month	Per unit			Total per month		
				Bid price	Immediate cost	Receipts	Expense	Receipts	Surplus
200	Acres	Clearing and grubbing	40	$200.00	$85.00	$180.00	$ 3,400	$ 7,200	$ 3,800
120,000	Cu. yd.	Earth excavation	60,000	0.42	0.31	0.38	18,600	22,800	4,200
86,000	Cu. yd.	Rock excavation	20,000	2.20	1.53	1.98	30,600	39,600	9,000
65,000	Yd. qtr.	Overhaul	16,000	0.02	0.017	0.018	272	288	16
18,000	M. gal.	Sprinkling	4,500	1.60	1.36	1.44	6,120	6,480	360
1,600	Hr.	Rolling	400	10.50	8.94	9.46	3,576	3,784	208
1,260	Lin. ft.	36 in. concrete pipe	320	10.60	10.88	9.55	3,482	3,054	—428
65,800	Cu. yd.	Foundation course	None	0.57	None	None	None	None	None
Total							$66,050	$83,206	$17,156

tractors from knowing the true estimated costs of the items of work.

Frequently the Instructions to Bidders will contain a statement to the effect that evidence of unbalanced bidding may be cause for throwing the bid out.

● *Unbalancing a Bid to Obtain Money for Financing Operating Costs.* The following example and Tables 2 and 3 illustrate how a contractor may increase the unit costs of work completed first in order to obtain money with which to finance his operating costs. Direct costs include material, if any, equipment, and labor, while indirect costs include overhead, profit, bonds, etc. The costs which a contractor will incur during construction operations include materials, equipment, labor, and some, but not necessarily all overhead. Profit is not an expense in this respect. If equipment is purchased on a deferred payment plan, it usually is necessary to make monthly payments, which may, when combined with operating costs, be more or less than the costs included in the bid for the use of the equipment. Generally it is possible to estimate reasonable accurately the actual expense to be incurred for each unit of work performed during the construction operations.

EXAMPLE. Consider a highway project which includes the items and quantities given in Table 1. Assume that the actual average expense incurred during the construction operations will be 85 per cent of the amount bid for each item, and that the contractor will be paid at the end of each month 90 per cent of the amount bid for each item of work completed during that month.

Table 1 gives the results of a balanced bid, while Table 2 gives the results for an unbalanced bid, for a period of one month during which the indicated quantities of work were completed. Table 1 indicates a probable surplus of $3,389 in receipts compared with expenditures, while the unbalancing in Table 2 indicates a probable surplus of $17,156 in receipts compared with expenditures for the month. Of course, after the more profitable operations are completed and work is confined to the latter operations which are unbalanced downward, there will be deficiencies in receipts compared with expenditures, which will use up all or most of the previously earned surpluses. However, this plan can provide surplus funds during the early months of the project, which may be of considerable assistance to the contractor.

One objection to unbalancing a bid for this purpose is that the accumulation of surplus funds in the construction account for the project may cause the contractor to become less vigilant and cost conscious, which may result in inefficient operations and excess expenditures to the extent that he may find himself in financial trouble during the latter part of the project. Also, since bid prices are unrealistic, it is difficult to project existing unit costs on a given date into possible true overruns or underruns, which condition is undesirable. If a contractor should fail to finish a project after completing and being paid for the more profitable items, the owner would not be able to secure completion for the amount remaining in his construction account.

● *Unbalancing a Bid to Earn More Profit Resulting from Variations in the Estimated Quantities.* The quantities specified by the engineer are usually designated as approximate, which

means that the actual quantities may be more or less than specified. Sometimes the difference may be quite large. If a bidder knows in advance that the quantities will vary substantially, and he knows the approximate actual quantities, he may unbalance his bid by increasing the unit prices bid for those quantities which will be larger and reducing the unit prices bid for those quantities which will be smaller than the engineer's estimate.

Table 3 gives the estimated quantities of earth and rock excavation for a project. Field tests made by a contractor prior to bidding the project might reveal that the combined quantities are correct, but that the actual quantities will be 80,000 cu yd of earth and 186,000 cu yd of rock. With this information available the unit price for earth can be reduced and the unit price bid for rock increased enough to offset the apparent loss resulting from underbidding the earth. This operation will not alter the cost of the project based on the estimated quantities furnished by the engineer. Actually the contractor can afford to underbid the entire project slightly in order to be sure that he gets the contract. An analysis of the prices bid and the actual quantities will reveal what happens.

Table 3 gives the results of the bid based on the estimated quantities and a balanced bid. Table 4 gives the results of the bid based on the estimated quantities and an unbalanced bid. Table 5 gives the results based on the actual quantities and a balanced bid. Table 6 gives the results based on the actual quantities and an unbalanced bid.

The only difference between Tables 3 and 4 is the unbalancing of the bid prices per unit for earth and rock excavation. The indicated total cost for both tables is the same. The differences in Tables 5 and 6 are the unbalancing of the bid prices per unit for earth and rock, the total cost for each of the two items, and the total costs of the project. The ultimate effect of unbalancing the bid gives the following total costs:

Table 3. Cost of a Project Based on Estimated Quantities and a Balanced Bid

Estimated Quantity	Unit	Description	Bid price per unit	Total cost
200	Acres	Clearing and grubbing	$100.00	$ 20,000
180,000	Cu. yd.	Earth excavation	0.36	64,800
86,000	Cu. yd.	Rock excavation	1.80	154,800
65,000	Yd. qtr.	Overhaul	0.02	1,300
18,000	M. gal.	Sprinkling	1.60	28,800
1,600	Hr.	Rolling	10.50	16,800
1,260	Lin. ft.	36 in. concrete pipe	12.80	16,260
65,800	Cu. yd.	Foundation course	1.46	96,068
	Total cost			$398,828

Table 4. Cost of a Project Based on Estimated Quantities and an Unbalanced Bid

Estimated quantity	Unit	Description	Bid price per unit	Total cost
200	Acres	Clearing and grubbing	$100.00	$ 20,000
180,000	Cu. yd.	Earth excavation	0.20	36,000
86,000	Cu. yd.	Rock excavation	2.14	183,600
65,000	Yd. qtr.	Overhaul	0.02	1,300
18,000	M. gal.	Sprinkling	1.60	28,800
1,600	Hr.	Rolling	10.50	16,800
1,260	Lin. ft.	36 in. concrete pipe	12.80	16,260
65,800	Cu. yd.	Foundation course	1.46	96,068
	Total cost			$398,828

Table 5. Cost of a Project Based on Actual Quantities and a Balanced Bid

Actual quantity	Unit	Description	Bid price per unit	Total cost
200	Acres	Clearing and grubbing	$100.00	$ 20,000
80,000	Cu. yd.	Earth excavation	0.36	28,800
186,000	Cu. yd.	Rock excavation	1.80	334,800
65,000	Yd. qtr.	Overhaul	0.02	1,300
18,000	M. gal.	Sprinkling	1.60	28,800
1,600	Hr.	Rolling	10.50	16,800
1,260	Lin. ft.	36 in. concrete pipe	12.80	16,260
65,800	Cu. yd.	Foundation course	1.46	96,068
	Total cost			$542,828

Table 6. Cost of a Project Based on Actual Quantities and an Unbalanced Bid

Actual quantity	Unit	Description	Bid price per unit	Total cost
200	Acres	Clearing and grubbing	$100.00	$ 20,000
80,000	Cu. yd.	Earth excavation	0.20	16,000
186,000	Cu. yd.	Rock excavation	2.14	398,040
65,000	Yd. qtr.	Overhaul	0.02	1,300
18,000	M. gal.	Sprinkling	1.60	28,800
1,600	Hr.	Rolling	10.50	16,800
1,260	Lin. ft.	36 in. concrete pipe	12.80	16,260
65,800	Cu. yd.	Foundation course	1.46	96,068
	Total cost			$593,268

Based on unbalanced bid	= $593,268
Based on balanced bid	= 542,828
Increased cost	= $ 50,440

• Keep your tires stored in a cool room. Low temperatures protect rubber quality. Do not store near boilers, radiators, or long in the sun. Cool, dark storage, away from moisture and grease, pays in lower tire cost.

AGC Board Meeting Airs Concern Over Labor Practices

James W. Cawdrey of Seattle nominated for 1959 presidency, with John A. Volpe, Massachusetts contractor and former federal highway administrator as vice-president.

Labor questions and the contractor's role in the road program were on the agenda of the Asssociated General Contractors' annual mid-year Governing and Advisory Boards meeting. Held at Atlanta, September 24, this meeting of the AGC leadership, representing some 7,200 of the nation's contractors, produced the following:

1. Nominated to run the big association for 1959, with by-mail election in December and installation at its annual convention next February in Miami Beach, were James Cawdrey, president and John A. Volpe, vice president.

Cawdrey will succeed highway contractor Fred W. Heldenfels, Jr., of Corpus Christi, Texas, is a member of the Seattle building contracting firm of Cawdrey & Vemo. He has served as president of AGC's Seattle chapter and chairman of the association's Building Contractors' Division.

Volpe, who heads a contracting firm bearing his name, of Malden, Mass., has uniquely doubled as an outstanding highway administrator. Punctuating his contracting career, he served as Massachusetts commissioner of public works and later interim Federal Highway Administrator in Washington. He is also a past national president of the American Society of Military Engineers, and a past regional vice president of the American Association of State Highway Officials.

2. A review of AGC's progress, presented by executive director James D. Marshall, stressed again the role of the contractor in a free-enterprise society. Despite the business dip, construction is at an all-time high but the association's leaders are concerned with national and world affairs that may affect contracting as an industry.

3. The association's Labor Committee, Frank J. Rooney, chairman, held an all-day session, and the subcommittee on labor policy and negotiations also met. An AGC staff report on current labor conditions was reviewed, with the spotlight again thrown on the featherbedding and other wasteful labor practices which were discussed at AGC's last convention at Dallas. The fear voiced at Dallas, that the promises of labor leaders on this problem were mere "lip service," has been fully justified according to this report.

"The results have been disappointing," said the report. "Putting it briefly, we think the cooperation has been very spotty and in no case wholehearted." In general, local representatives of unions have not taken AGC's 10-point policy statement very seriously. In some cases AGC members have not attempted to take full advantage of the 10-point statement. Strenuous insistence on compliance with this policy was urged on the members.

4. The major role of the construction industry in helping to pull the nation out of the recession, was emphasized by president Fred W. Heldenfels, Jr. The total of construction reached $31.5 billion for the first eight months of 1958, an all-time high and still climbing. The sharp rise in road projects was credited with an important part in this record.

"The construction industry has again fulfilled its historic roles as a stabilizing force in the nation's economy," said Heldenfels.

5. The AGC instituted the "H. B. Alexander Commendation Award," to be presented each year beginning in 1959 to the contractor with the greatest number of accident-free man-hours achieved during the year. Alexander who has headed the association's accident prevention committee for the past nine years, is known as "Mr. Accident Prevention in the industry.

The Legislative Committee in its Atlanta meeting reviewed the work of the 85th Congress on matters of interest to the construction industry. A series of appearances of AGC leaders before various congressional committees helped to inform Washington leaders on industry questions needing attention.

Specific federal legislation still needed, in the AGC committee's belief, include:

1. Legislation making it a federal offense to destroy or damage construction property or equipment on federal or federal-aid projects.

2. Court review of Davis-Bacon administration matters.

3. Protection of the priority of recorded mechanics liens over unrecorded federal tax liens.

4. Provisions for an adequate airport program similar to that which passed the Congress but vetoed by the President.

5. Legislation to set aside the pay-as-you-go provisions contained in present federal-aid highway law.

6. Prohibition of federal reimbursement to states for costs of utility relocations on federal-aid highways.

7. Measures to prohibit the use of highway trust fund money for administrative expenses of any department or agency of the federal government other than the Bureau of Public Roads.

Waite to Head California Highway Conference

C. E. Waite, California Deputy State Highway Engineer, will serve as general chairman of the Eleventh California Street and Highway Conference, which will meet in Berkeley, Jan. 28-30, 1959. Waite, the deputy for administration and management of the California Division of Highways, is a member of the Executive Committee of the Western Association of State Highway Officials.

The California conference which he will chairman is presented annually by the Institute of Transportation and Traffic Engineering, of the University of California. It is designed for road officials from all governmental levels and for representatives of both public and private organizations having interest in road affairs.

The 1959 conference will provide an expanded program to cover the many local problems growing out of stepped-up schedules and the explosive growth of population and traffic in various California communities. To accomplish this without lengthening the conference, the program will include a series of small-group meetings where practical problems can be discussed in detail by conferees.

CONSTRUCTION SPEED VS. HAPPY CONTRACTORS

THE world record for a day's concrete pour has been broken several times in Michigan recently. The latest burst is described in an article in this issue. Michigan has several contractors who can run a "four minute mile" with their pavers, as a result of outstanding managerial ability plus good equipment. Three-paver outfits with big-tonnage automatic batching seems to be the order of the times in this state, where the competitive yardage pace is well ahead of that established as a norm in many other states.

One contractor has asked us, "what is this all coming to?" Actually Michigan concrete paving contractors are not happy, despite the fact that this state is supposed to be the happy hunting ground of the man with a paver. The state has paved its arterials 100 percent with p.c. concrete, up to the recent much-discussed decision to split the program partly with asphalt. Metropolitan Detroit alone has been a tremendous reservoir of paving projects, with concrete slab integral with rolled curb a relatively low first cost item and many contractors geared to build this product.

● The "what's it coming to" question was voiced because, despite the recent high volume level of jobs, this has been a slow year for Michigan state road lettings, and a year in which jobs have gone too cheap often to permit much of a profit. The contractor we quote wonders where the speed race will end. He is frightened at his productive capacity and the collective capacity of his local fraternity—which is so great that a big program of military airfield awards recently was taken in stride, with the contractors still sharpening their pencils. This spokesman thinks perhaps that he and his adversaries, who have repeatedly taken the yardage record from each other, have created too much publicity over high-speed performance. The job that used to make a nice season's work, now is done by August, and the contractor who hasn't another large run or several short jobs lined up feels he is about to go broke. He may have overlooked the fact that the equipment sitting in his yard has already earned a good profit—or, if it hasn't whose fault is it, some would say.

● All this has a familiar ring. Earthmoving contractors have been making this kind of conversation for thirty years, while going through revolution upon revolution in equipment size, speed, capacity, operating efficiency and, of course, equipment investment. Some of these fellows, too, get frightened—so much so that they have nightmares at the idea of having to carry a job over the winter, and so get extra machines to finish before frost.

Competition will always be the spur to faster, more efficient contractor performance. Of course there is a limit to long-sustained high speed, beyond which costs go up. But we doubt that the newspaper headlines on the Michigan pavement records have contributed to the tough price competition there. The local contractors hear quickly of each other's performances, and get around to watch and pick up the other fellow's tricks.

The best insurance against a profitless boom period in road building is a better realization of actual costs. The Michigan Road Builders Association and other agencies have helped contractor members focus on the importance of cost keeping. Knowing costs will not keep some contractors, especially new ones, from committing commercial suicide, but it may at least cut down the number of rash bidders. Publicity and education here, directed to distributors and finance companies, also may help keep new superintendents-turned-contractor from profitless bidding.

Meanwhile, if you want to compete for concrete road work in Michigan, you'd better be prepared to bid off and handle around a million yards per year per outfit, and know and apply all the tricks of good management.

Consultants Too Have Political Problems

The editorials run in Roads and Streets in August and October on the question of consultants in highway department work has brought an avalanche of mail. Naturally a great many consultants have praised our position.

On the subject of highway engineering as a career, with the desirability of having such a career in the realm of private enterprise, one point has been overlooked in our discussion. That is the fact that many consultants are aligned politically, so that when there is a change of political administration in any state, the consultants are sometimes left out in the cold until "the other set of rascals" can get back into power.

Civil engineering technology knows no politics. Department personnel and consultants alike need to be secured against political spoils. Any incoming state governor who desires to give his constituents their biggest money's worth in highway construction should first of all be sure that a competent leader is running the highway departments and secondly, should leave him alone. A free hand was never more important than today with the huge sums at stake in a highly paced design and construction program.

One-Man Batch Plant and Three Pavers Place—

Record Day's Concrete Footage

Denton Construction Company in Michigan reports 6,029-foot run in 12½-hour day, narrowly beating Sargent Construction Company's 5,787-foot-run announced a few days before.

In Michigan this past summer two contractors successively hung up new records, at least for Michigan, in daily concrete road footage poured in a working day with a single paving outfit. Each firm used three pavers for full-width placement of 9″ x 24′ mesh-reinforced slab.

The excitement began on a July day when the crew of Sargent Construction Co., Saginaw, in the midst of its U.S. 12 project near Galesburg, Mich., decided to shoot for a record. Between 5:00 a.m. and 6:00 p.m. the men made 5,787 lin. ft. and quit while the sun was still high.

When word got around, another Michigan company known for its job speed and efficiency, and a holder of the 1957 records, decided to take over the crown again. Denton Construction Company's crew, working on a 9-mile dual roadway job on U.S. 23 relocation near Dundee, Mich., checked over its equipment, put in a 12½-hour paver run—and tallied 6,029 ft. This is believed to be a national record.

These notes and pictures were taken on a visit to the project a few September days later while the outfit was still in high gear. The Denton performance, like that of Sargent, was simply a special burst of effort of an organization that is managed and equipped for steady high-speed paving as the key to a profitable season's operations.

Denton's production on U.S. 23 was credited chiefly to three factors: seasoned top management, outstanding care of equipment*, and balanced productive capacity for sustained high-speed construction.

Denton was the first Michigan contractor to put three pavers together on routine concrete road paving. The record-breaking U.S. 23 job used three Rex 34-Edual-drum pavers.

Also out front is the batch plant used here. We will begin by describing some of the features of this facility, the Butler Integrated TX4 Batching

*Contractor Builds Show Place Shop; Road and Streets, March, 1955.

● This plant is knocked down in a day, hauled out in 22 truck and trailer loads over night, and set-up the next day at a new location.

● Butler Integrated Batching System, as set up on the Denton U.S. 23 project. One pause for quadruple batch loading at each station took only 35 to 50 seconds total for four stops.

● **Arrow shows driver pushing button to open batch gates for course stone. Note straight run through the four stops. This plant can keep up with four pavers — Denton used only three.**

System. Four-compartment trucks were loaded in a straight-line run under four Butler-engineered units. In a typical run-through, the truck driver, after doing his own checking of batch boards, pulled under the coarse stone bin at, say, 11:03:06 a.m., using a mirror for an accurate stop. With a stick hung in his cab, he reached out and poked a push button, opening four gates for his stone. Another poke at the button closed the gates and started the re-loading cycle. Moving ahead, at 11:03:16 he took on the small stone, again poking the buttons. At 11:03:28 he took cement; this time with a pull of the lever-performed by the *only man on the entire batch plant,* who also handed the driver his load ticket. At 11:03:44 the driver received sand with a poke at the buttons, and was on his way to the paver. Elapsed loading time—38 seconds, which was about "par" for the course. The next truck was only seconds behind.

The four units, all fully automatic, have quite a history. They were purchased off the Road Show floor in Chicago, in January, 1957, and last year handled over 1,000,000 sq. yd. of paving. The two stone and one sand batcher each have 100-ton bins. The cement bin and silos had 1,800 bbl. capacity for this job. The speed with which this line of bins sent out trucks was due to the tightly triggered push-button compressed-air gate mechanism and to the quadruple weigh-batchers. The batchers enabled the drivers to eliminate the slight move-ahead necessary in positioning trucks under individual spouts; only one tripping and closing operation instead of two, at each of the four stops.

The actual time of paver operation on this day was 12 hours. In that time 2,968 batches, each with 728 lb. of cement, were used. That meant 483 bbl. of cement per hour up the single elevator.

Aggregates were trailer-delivered over a ramp road located back of and parallel to the bin line. Aggregates were dumped through grills onto 30" x 60' portable conveyors, one for each of the three stockpiles. Materials were rehandled into the bins by two cranes each with 2⅓-yd. Erie clamshell buckets. The cranes, a Link-Belt Speeder and a Koehring 605, had operators exceptionally skilled in fast swinging and rapid handling. One machine fed coarse stone into

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BEST BUY IN NEW AND USED EQUIPMENT

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● **Heltzel combination finisher and bull float following a Jaeger spreader on the top lift.**

Bin 1, the other fed sand into Bin 4, and the two took turns feeding small stone into Bin 2. (Bin 3 was for cement). One craneman would feed Bin 2 while the other rehandled material to loosen or dress up the pile or move stone within handier reach. The pile for Bin 2 was actually a double one, aiding the doubling up of the two cranes.

The two crane operators confined their crawler travel almost entirely to one smooth, well compacted path parallel to the line of bins.

Meanwhile on the other side of the batchers, cement delivery was continually in progress. Cement arrived in large tandem tankers, and the job management saw to it that a load was always waiting to be fed into the cement screw.

A final point about the batch plant layout was its roominess. Contractors who have suffered job slowdowns by failure to provide a large enough space will appreciate the layout shown in the accompanying sketch. The haul paths were free of sharp kinks. There was room for extra trucks or other equipment to line up.

(Continued on page 60)

● **Water-filled rollers giving final compaction to the limestone screenings before placing concrete. Rollers, and just ahead, a final screen, both towed by the Buckeye subgrader which worked ahead on an anchored winch line.**

"WILL OUTPERFORM ANY MACHINE IN ITS CLASS!"

This Cat-built Traxcavator is loading out soil from spoil heap for grade fill and shoulders — loads out 10-yd. trucks, servicing 5 trucks with a 2-mile haul. Handling damp hard-pan, the husky No. 977 operates in 2nd and 3rd speeds and loads 10 yd. in 2½ min., averaging up to 2,000 yd. per 10-hr. day. The Minnesota State Highway job is 5.4 miles long and it calls for an excavation of 840,000 yd. of all classifications.

That's the way Mr. Markham of the E. Markham Construction Co., St. Paul, Minnesota, feels about his Cat No. 977 Traxcavator, shown loading out soil for grade fill and shoulders on a state highway improvement job in St. Paul.

Owner Markham feels that CAT-built equipment is the "most reliable and best mechanically." He says, "Caterpillar Tractor Co. has wisely shown an understanding of the contractors' equipment needs —no fancy do-dads that look good on paper and flop in operation—just down-to-earth improvements that really work."

Dependable, versatile performance is typical of Caterpillar's line of Traxcavators, from the rugged No. 977 to its tough, agile smaller brother, the No. 933. These finely balanced work units are engineered for the *hard* work, with welded steel frames, lift arms and cross braces of strong, box-section construction, and tilt arms of solid steel. They're easy to handle with quick-acting hydraulic controls.

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The 50 HP No. 933, as well as the larger No. 955 and No. 977, are available in the new Series E, with extra-sturdy undercarriage for applications which put the greatest stress on your equipment. And the new side dump bucket can be had for the No. 955 and No. 933 Traxcavators. For complete details, see your Caterpillar Dealer. He'll be glad to talk your kind of language in a deal for the best in earthmoving equipment. And he'll back you up on expert service and parts you can trust.

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A NEW DIMENSION IN LOADER VERSATILITY

These International TD-24 Tractors are working on a connection between the New York and New England Thruways. According to their owner's they've given uninterrupted service since delivery in May, 1956.

9 torque converter equipped TD-24'S show endurance on huge N. Y. highway job

The immense job involved some 1,270,000 cubic yards of earth and rock excavation, 22 bridge structures and 11.93 miles of pavement for the connection between the New York and New England Thruways. The $13,572,000 contract went to two prominent New York contractors, Rusciano Construction Corp. and Del Balso Construction Corp. And the really tough jobs were handled by nine International TD-24 Tractors equipped with torque converter drives.

"Availability" was the key to profitable machinery operation on this project. And as both contractors pointed out: "Each of these nine TD-24's has given us continuous and uninterrupted service since delivery in May, 1956."

The torque converter multiplies engine torque up to 6:1 . . . permits the engine to deliver maximum horsepower whenever required . . . automatically matches power to load demands . . . and instantaneously matches tractor speed to scraper travel, for faster loading and less shock between the machines.

With a torque converter drive, gear-shifting is minimized or eliminated, for higher operator efficiency and less fatigue. Load pick-up is smooth and even, without clutch slippage. Shock loads and vibrations are cushioned out, for longer tractor life and less maintenance.

All three of the "big three"—Allis-Chalmers, Caterpillar and International offer torque converter drives as standard or optional in certain tractor models. And all three standardize on Twin Disc Torque Converter components for their torque converter drives.

Specify a torque converter drive in your next track-type tractor. See for yourself how the torque converter proves the wisest possible investment in heavy-duty machinery.

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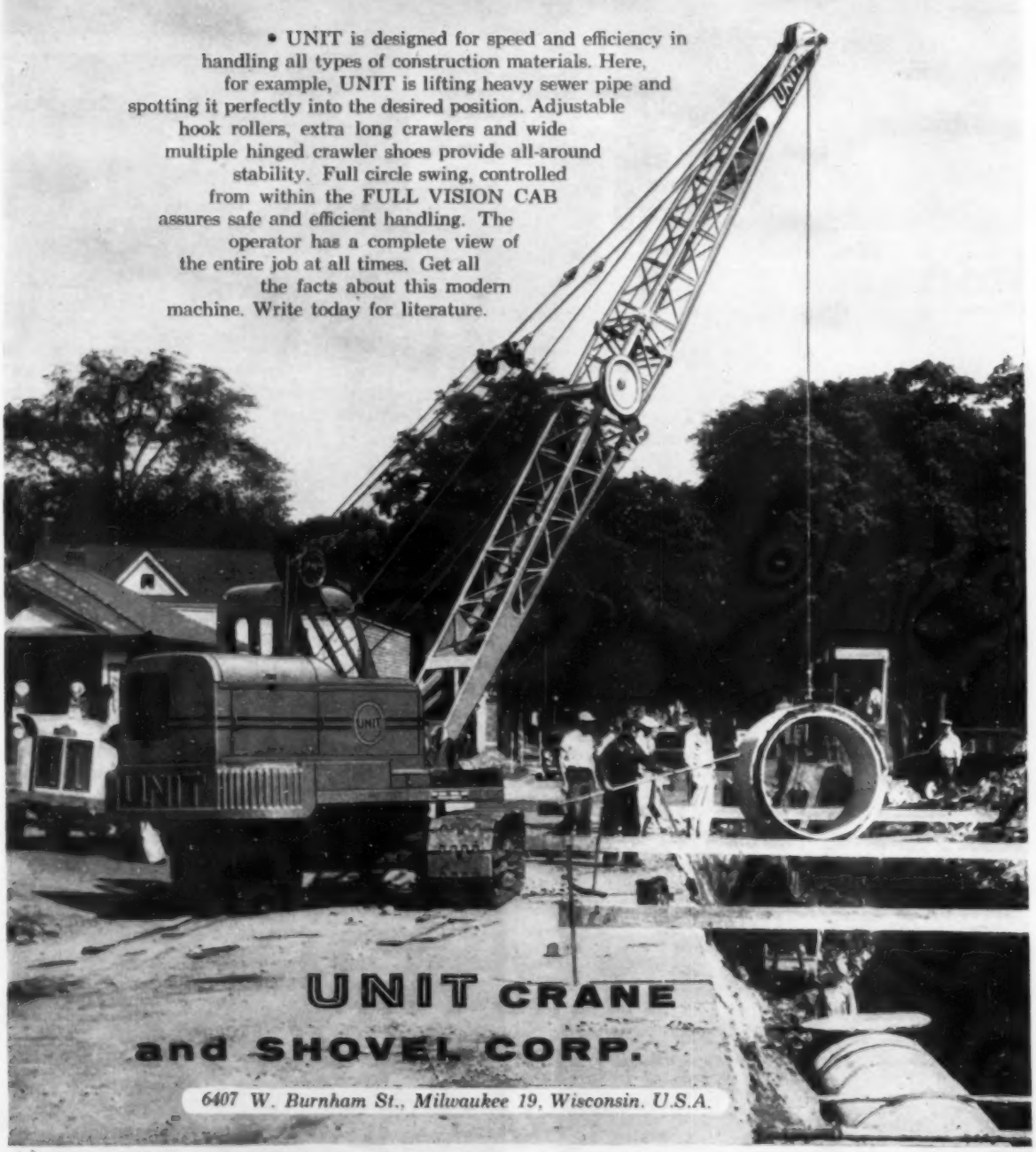

UNIT CRANE and SHOVEL CORP.

6407 W. Burnham St., Milwaukee 19, Wisconsin, U.S.A.

AS-5020

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● Electric power for batch plant and belt operations was supplied by the GM Detroit Diesel unit shown. Crane on sand bin is a Link-Belt Speeder.

● Tandem trailers delivering aggregate via elevated ramp to one of the three stockpile belts.

● The only man on the plant—cement tally man handing trip ticket to driver at cement stop.

(Continued from page 56)

The stockpiles, requiring no bulkhead confinement, were kept to approximately the right size for convenient clamshell handling with 65 ft. booms. The crane operators had to do considerable rehandling from the belt flow to stockpile, taken care of at odd moments; a system which was considered more economical than using three smaller cranes or longer belts which might interfere with clamshell operation.

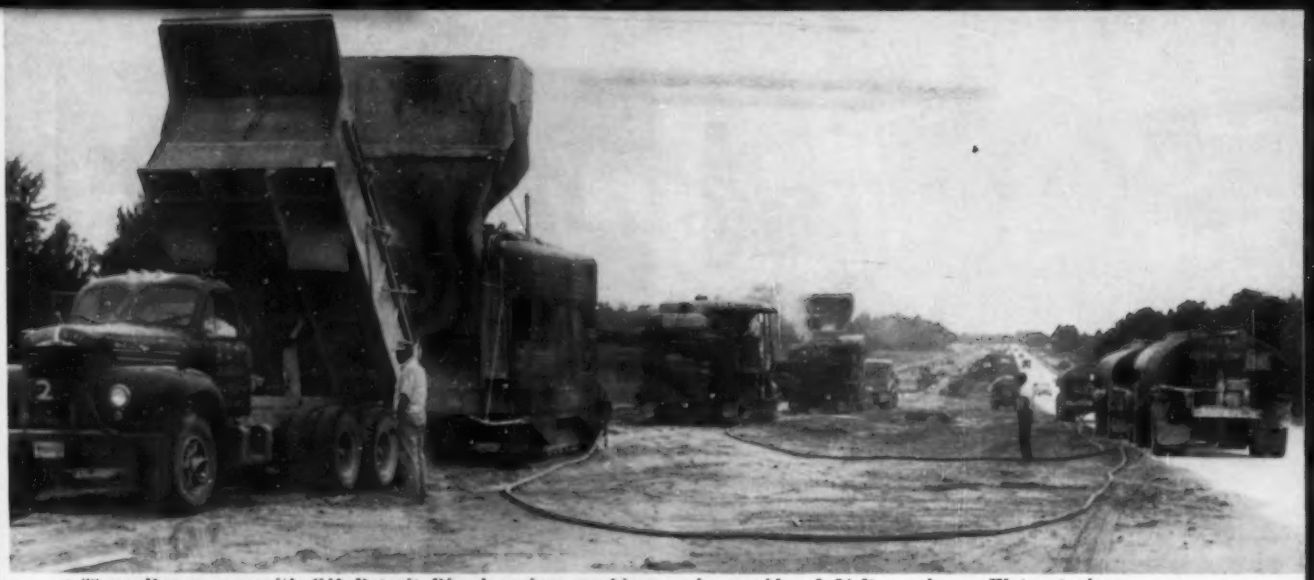
Power for the belt motors and electric plant controls came from a GM Detroit Diesel plant stationed on rubber tires in an out-of-the-way corner. Power cables were carried to the various units via shallow buried ducts.

● *Three Pavers On One Side.* Ample work space also was an aid to job efficiency at the pavers. The 60 ft. median, which will be depressed in the finish grading, was kept filled in as a level working area. (The median actually thus served also as a temporary storage space for dirt needed in dressing out the shoulders, a good expedient in the absence of right-of-way space.) The three pavers were stationed on the median side. The first two were worked with skips toward the direction of progress; the rear paver, used in placing the top lift, had its skip to the rear. The second paver helped the top lift when needed to keep the progress in balance.

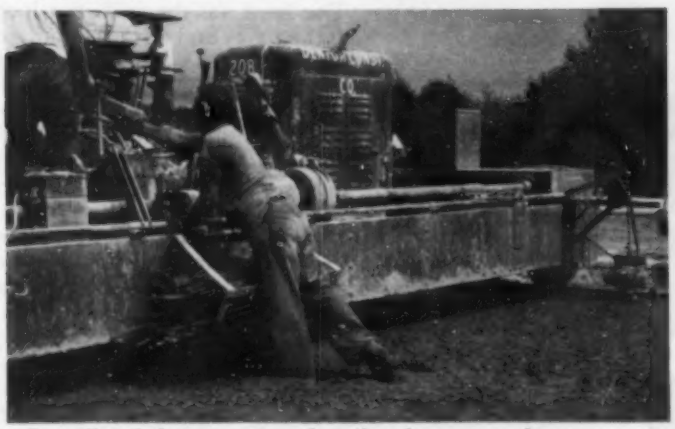
Water was delivered in five 2,700-gal. semi-trailer tankers, two in transit or standing by, three spotted approximately alongside the pavers. The tankers were kept well over on the far side of the median, next to the opposite roadway. Tankers were equipped with Rex 3-in. gasoline powered pumps mounted on the rear, and about 150-ft. of heavy-duty rubber hose.

● Just ahead of the pavers two men shoveled away loose excess material along forms and also applied form oil.

● The 2,700 gal. tankers (one for each paver) supplied water from Rex 3-in. gasoline engine driven pumps mounted on the rear.

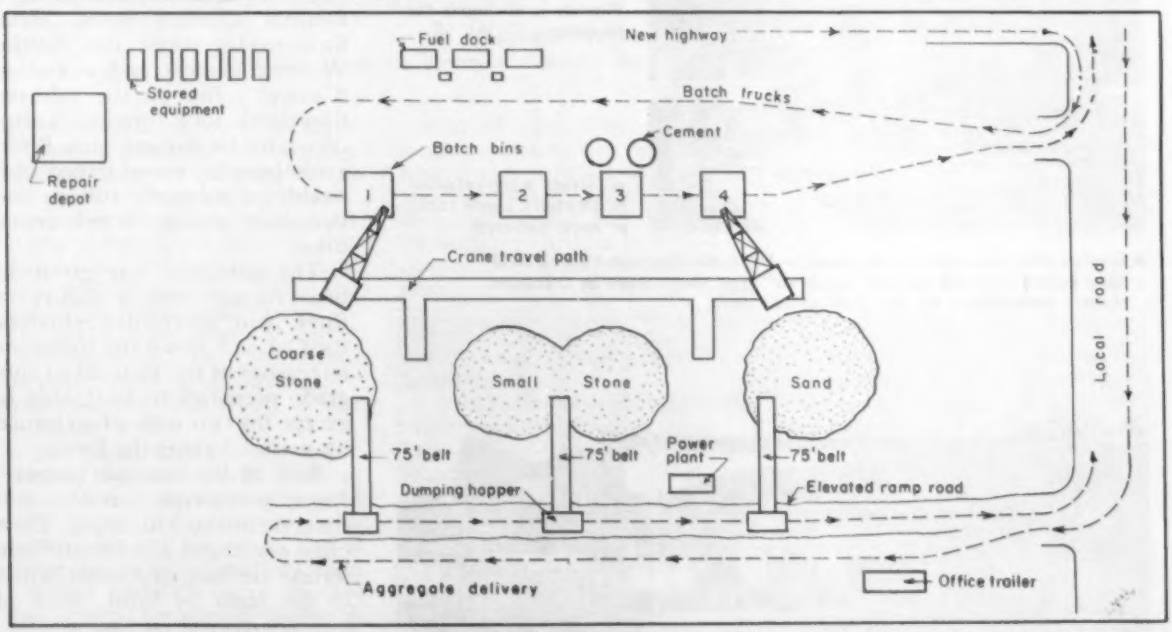


● Three Rex pavers with GM Detroit Diesel engines working on inner side of 24-ft. roadway. Water tankers — one for each paver — parked on the other roadway slab. Note dragging hose lines, which had to take some crossing by batch trucks.



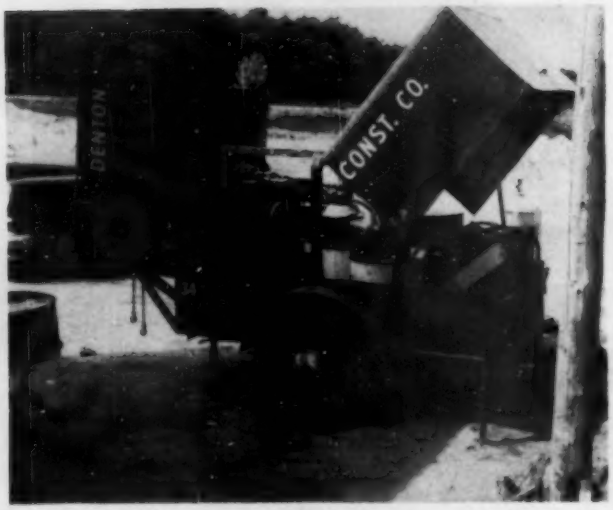
● Centerline tie-bars were stored on the advance spreader frame and fastened by hand to the wire mesh.

● Placing dowel assembly for dummy joint—done with men taught the need for precise stringline positioning.



● General layout of Denton Construction Co. batch plant and yard for the U.S. 23 Michigan project. (Not to scale).

● Grease and oil dispensing truck on Denton job was partly roofed over to protect the compressor from the weather.



● Denton-built tow cart for small compressor and lubricants, stationed on its own stilts alongside the field shop.

● Denton's dock for diesel and gasoline, located alongside the plant, consisted of three over-the-road type tankers up on blocks. Sinclair is obviously the supplier.

● Pavers were refueled by Denton's 2-axle tanker here pictured.

● Roofed oven but open to the breeze—Denton's concrete floored field shop reflects a trend toward "fresh air" type shops, even in northern states; appreciated by the men on hot days.

The hose was dragged in a loop as the paver and its tanker moved forward. The pavers usually worked far enough apart so that batch trucks could come and go with least running over the hose. Since the ground was relatively uncompacted, some run-overs were permitted as an expedient.

Batched material delivery was a routine needing little comment here, except to note that Denton keeps this function under tight control on his jobs by having his own trucks and drivers. The fleet here consisted chiefly of single-axle Macks with Converto hoists and bodies.

The equipment train included familiar standard items: Metaform paving forms, two Austin-Western graders and a Galion 3 wheel roller on the subbase, Cleveland form grader, LeRoi Tractaire for driving pins, Buckeye subgrader, towed screed with steeldrum subgrade rollers, and two men setting dowel assemblies.

The subgrade was given its final rolling with a cluster of three 14-in. water-filled cylinders, used to pack down the limestone screenings as the final act of subgrade preparation—final, that is, except for two men who cleaned up material along the forms.

Back of the first two pavers a Jaeger screw-type spreader laid concrete out to 5 in. depth. Then came placement of mesh and centerline tie bars, the latter wired to the mesh by hand. Back of

(Continued on page 81)

• William H. Lamberth (standing), secondary highways engineer, leads a discussion of Colorado's highway laws at a recent state-county highway conference.

How Mutual Problems are Theshed Out at

Colorado's State-County Road Conferences

Regional meetings, required annually by law, give management training to county men and brings state personnel closer to state's local road programs and needs.

By William H. Lamberth
Secondary Highways Engineer, Colorado Department of Highways, Denver

For the past five years, the Colorado department of highways has amplified the carrying out of the state's highway act by conducting regional seminars on highway management, construction and maintenance for commissioners of Colorado's 63 counties. "This is a project we feel we should undertake whether the law required it or not," chief engineer Mark U. Watrous declared, when he opened the first conference of the series in the spring of 1954.

The department quickly found that the eight state-county highway conferences held each year provided newly-elected county commissioners with orientation on one of their principal functions, and served as refresher courses on road management for veteran county officials.

And the state highway staff realized, as soon as the district engineers began to outline topics for the area meetings, that exchange of information would run both ways. By bringing in their problems the county road men have enabled the state employees to realize better what Colorado's road needs are, in respect to technical requirements, organization and equipment as well as money.

Coordination of road information at the one-day area meetings has been insured by inviting U. S. Bureau of Public Roads and state highway patrol officials to join the state and county highway staffs. U. S. forest service men have also joined conferences in areas where large tracts of Federal reserve made their comments pertinent.

These cooperative joint meetings are planned by the state highway department to make the most of a section of the Colorado Highway Act of 1953. This act orders the department to hold a meeting "at least once a year . . . for the expressed purpose of exchanging information with representatives of the counties relating to highway construction and maintenance."

The chief engineer realized that the different types of mountainous, rolling and irrigated prairie terrain contained in Colorado's 63 counties and the 104,247 square miles of state area, would make a single general meeting impracticable. So it was decided to form eight area meetings, and to hold them in the relatively slack period for roadwork —February to May.

(Continued on page 75)

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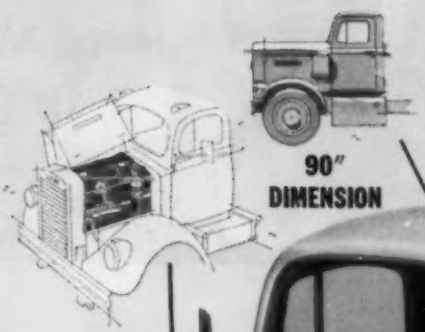

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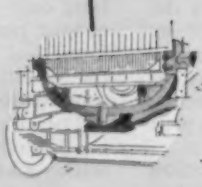

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Ideal steering geometry improves stability and gives radius rod action. Front springs are anchored firmly at front and shackled at rear.

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Heat treated body-fit bolts with lock nuts fill the hole exactly and permit use of higher strength material than it is possible to use with rivets.

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Engineered to your work requirements in single reduction, doubled reduction hypoid, double reduction planetary, with applicable axle ratios and your own choice of suspension.

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Double channel frame of chrome manganese heat treated steel with triple liner reinforcement to add strength and last longer.

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One of a Series on
State Highway Program Progress

West Virginia Launches

● West Virginia officials debate the next move; Chief Engineer M. L. O'Neale, commissioner Patrick C. Graney, Deputy Commissioner George E. White, and Assistant Engineering Director L. B. White.

A special *Roads and Streets* report on how one state is breaking the preliminary engineering bottleneck, to survey, map, locate and design 828 miles of major highways and nudge them toward the construction stage.

A "crash" program of preliminary engineering is pushing $530-million worth of Interstate highway work toward the construction stage in West Virginia, thanks to a wholesale adoption of modern engineering methods.

For the last two years, the West Virginia state roadbuilding program has lagged far behind that of other states. A listing of states by their rank in proportion of Interstate jobs under construction recently showed West Virginia 45th down the line. Beset wiith staff shortages and money problems, the highway department has just not been able to get the program off the ground. The biggest roadblock has been the lack of preliminary engineering and design for 306 miles of Interstate routes.

Late in 1957, officials decided to take drastic action. Their first decision was to forget about trying to complete the huge mapping, location, and design job with their own limited forces and to turn to qualified engineering consultants. They drafted a priority surveying and mapping schedule for these firms, and then urged them to utilize every production shortcut developed in recent years for surveying and locating new routes, and for producing plans and cross-sections for design and construction.

The firms selected have tackled the job vigorously, and within one working season have completed engineering chores which by traditional methods would have taken several years. In fact, officials say, the state's whole Interstate System will be advanced to the design and contract awarding stage one or two seasons sooner than expected.

Also under the crash engineering effort, 521 miles of Primary System routes are being surveyed, mapped, and designed.

● *Ten Aerial Companies.* Ten organizations specializing in aerial engineering were called in to fly and photograph the proposed routes and to produce contour maps and cross sections suitable for location of the 828 miles of new highway. The Department has been able to determine many miles of final location already this year on the basis of the data, and consultants have been retained for design. For the last few months the survey engineers have been swarming over the West Virginia hills and, with the aid of electronic instruments and helicopters, establishing the necessary ground controls, then taking to the air for hundreds of aerial photographs. Now, with plotters and elec-

Aerial photography, tellurometers, helicopters and computers are pressed into service to accomplish in months what used to require years

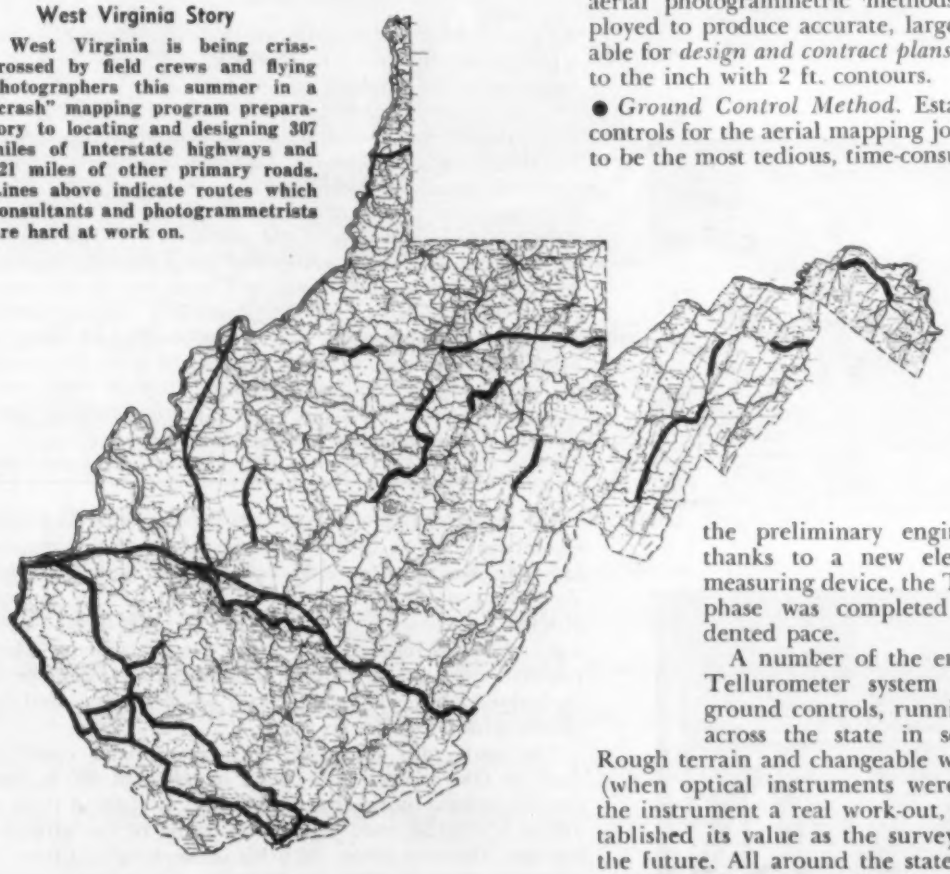
'Crash' Engineering Program

tronic computers, they are producing literally thousands of contour and planimetric maps, cross sections, and profile sheets.

In both the field and the drafting rooms, the consultants have pressed into service numerous new techniques developed within the last few years.

West Virginia Story

West Virginia is being criss-crossed by field crews and flying photographers this summer in a "crash" mapping program preparatory to locating and designing 307 miles of Interstate highways and 521 miles of other primary roads. Lines above indicate routes which consultants and photogrammetrists are hard at work on.



A large-scale mapping operation was the first step. A big share of the state's Interstate net runs through rough terrain. The engineers flew and photographed the 828 miles during the 1957 autumn and 1958 spring and produced contour maps at a scale of 200 ft. to the inch with 5 ft. contour intervals for *location*. This spring a number of design contracts were negotiated and again aerial photogrammetric methods are being employed to produce accurate, large-scale maps suitable for *design and contract plans*—this time, 50 ft. to the inch with 2 ft. contours.

● *Ground Control Method.* Establishing ground controls for the aerial mapping job had threatened to be the most tedious, time-consuming portion of the preliminary engineering. Instead, thanks to a new electronic distance-measuring device, the Tellurometer, this phase was completed at an unprecedented pace.

A number of the engineers used the Tellurometer system to put in their ground controls, running long traverses across the state in several directions. Rough terrain and changeable weather conditions (when optical instruments were unusable) gave the instrument a real work-out, and definitely established its value as the surveying technique of the future. All around the state during the 1958 summer, field crews using the system chalked up new surveying records.

Electronic Surveying and Aerial Mapping Are Chief Time Savers in West Virginia

● *Step 1.* First step of the huge surveying operation was to establish ground controls through areas to be air-photographed and mapped. Here's where the new electronic distance measuring instrument—the Tellurometer—got a workout. One of John F. Meissner Company's crew members here operates an electronic instrument to measure the distance between this transmitter and a receiver, located out of sight across an intervening meadow, heavy brush and ravine (see arrow). This crew, incidentally, set a record pace with the Tellurometer system, measuring as many as 27 stations along a proposed route in one day.

● *Step 2.* West Virginia skies were full of aerial photographers early in 1958 when the state's crash mapping program got under way. Ground controls were established. Then the surveying operation took to the air. Consultants utilized aerial photography along almost all of the proposed routes, using either their own photogrammetry departments or calling in photogrammetry specialty firms. The precise photographs registered everything necessary for determination of the best route and design—all elevations, the right-of-way to be acquired, land use, potential aggregate supplies, and earthwork quantities involved along any projected route. Here a pilot and aerial photographer for Alster and Associates, study their next flight line.

● *Step 3.* After photographs were taken, photomosaics were sometimes compiled to help officials determine best route locations. Here two Fairchild Aerial Surveys (Los Angeles) employees piece together the hundreds of prints required. Fairchild flew and photographed an 80-mile stretch, so winding that 25 different "passes" had to be made over the area to obtain bands of right-of-way.

● *Step 4.* The consultants and photogrammetrists retained for the West Virginia operation utilized a battery of modern plotting devices in the laboratory to turn out the thousands of drawings required by design engineers. Michael Baker, Jr. Company has location studies on 165 miles of Interstate System, and to design plans for another 34 miles. His assignment included mapping the entire City of Charleston. Shown here is one of Baker's stereo-plotters turning out a contour map from aerial photographs.

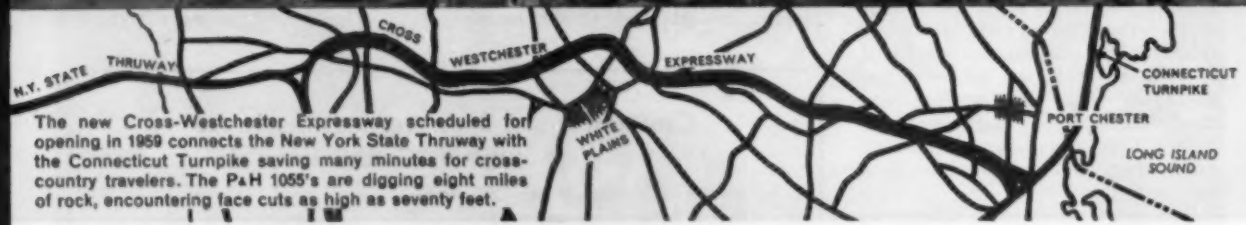
For instance, a John F. Meissner crew measured up to 27 legs a day down a 54-mile traverse. It normally requires only one man to operate theTellurometer transmitter and another at the receiver, but Party Chief C. C. Hamilton assigned an extra man to each of these units to take notes and to help assemble and dismantle the instruments. These two-man crews reached the point where they could set up their respective instruments, take a set of readings and dismantle within 20 minutes.

The party also discovered their instruments could be made to take accurate short shots of less than 400 ft., and they capitalized on this feature heavily. It enabled them to follow a winding road just off the route of the proposed highway, shooting across the fields between tight curves.

Other crews preceded the Tellurometer crew for recon-

(Continued on page 70)

8 of these 3½ yd. P&H shovels dig 3,000,000 yds. on the Cross-Westchester Expressway



The new Cross-Westchester Expressway scheduled for opening in 1959 connects the New York State Thruway with the Connecticut Turnpike saving many minutes for cross-country travelers. The P&H 1055's are digging eight miles of rock, encountering face cuts as high as seventy feet.

Eight P&H 1055's were chosen by three contractors to excavate tough Westchester rock. With P&H all-welded construction of alloy steel and a thousand other strength features, the 1055's can take the constant punishment of digging this rock. P&H Magnetorque® swing provides consistent, fast production, resulting in higher profits. See your P&H dealer for complete details on P&H excavators from ½ to 3½ yds. and P&H truck cranes from 10 to 70 tons; the most complete line in the industry.

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin

. . . for more details circle 275 on enclosed return postal card

(Continued from page 68)
naissance and another followed to turn angles. Although only 3rd order was specified (allowable error of 1 part in 5,000), the Tellurometer crews obtained accuracies far in excess of this.

• *Helicopter Debut in Road Surveying.* One of the firms—Air Survey Corporation of Arlington, Virginia—developed another twist in highway surveying in this area of wooded mountains. The party chartered a helicopter to transport crew members from station to station down a 100-mile traverse. (Bureau of Public Roads officials believe this is the first time a helicopter has been used in the U. S. for highway location.) This procedure enabled the party to complete its assignment at a record pace, and under extremely unfavorable weather conditions which would have prevented a crew using optical instruments from operating at all.

The terrain over this segment was hilly and timbered, which would have been difficult to either chain or triangulate. In addition, roads were sparse and unusable because of heavy snows and rains. The weather was foggy and wet, with frequent rain and snow squalls, yet the completion schedule called for extremely rapid work. One engineer would set up a portable radar-like transmitter at one point, while his teammate simultaneously mounted a receiver on a tripod at the other point. Then the crew would proceed to send a series of micro-waves across the distance, clocking the time—in billionths of seconds—it took the impulses to make the trip. This reading was then translated into miles, feet and inches. Operators, out of sight of each other, communicated by two-way radio.

The two devices made a remarkably effective combination. The fast action of the Tellurometer in measuring the distances, and the speed of the helicopter in transferring crew men across the valleys, made it possible for the crew of four to leapfrog down the traverse in record time.

In fact, traditional methods in this particular instance would have required probably ten times as long, considering the weather, the terrain, and the scarcity of trails, John Wallace, Air Survey's president, claims.

J. Stephen Watkins, consulting engineers, of Lexington, Kentucky, also utilized new plan production methods to accomplish its assignment on another stretch of the West Virginia project. The firm called on Aero Service Corporation of Philadelphia to provide photogrammetric services. These included establishing ground controls, flying and photographing the area, then producing topographical maps, planimetric maps, and cross sections.

Modern laboratory techniques were brought into play here. Aero Service transferred its cross-section data directly from the photo model, while on the plotter, to punch tapes. These could be fed into an electronic computer to determine earthwork quantities. The same data were also fed into an electronic plotter which drafted cross-section sheets.

The job proved challenging even to pilots accustomed to tough aerial photography jobs. For example, Fairchild Aerial Survey of Los Angeles had a stretch of 80 miles to map for location study. The route followed the course of a winding valley between steep and rugged hills. The crew found that the only way the route could be photographed was in a series of 25 short dashes down the length of the survey. Usually one continuous flight

(Continued on page 75)

Benefits of Competition Shown

Officials in West Virginia are pleased with the economy of the huge program, achieved despite the speed required. Complete cost of aerial photography and mapping of the 306 miles of Interstate system came to $245,600, an average of $802 per mile. On the 521 miles of state primary routes, aerial photography and mapping prices averaged $772 per mile (from a low of $673 per mile to a high of $865) for a total of $386,100.

Several states have recently created their own aerial photography photogrammetry divisions for the purpose of doing just such work as West Virginia has now under way. Highway officials there, however, have in some cases revealed that this is not the most economical, nor the fastest approach. As one state official put it:

"Most departments do not have enough volume to justify maintaining such an organization. We are obtaining excellent competitive prices from private firms in this field. We think the result is a substantial saving in time which will permit us to get our construction program in high gear."

Consultants and Photogrammetrists in the West Virginia "Crash" Job

For *location* of Interstate routes (307 miles):	
Michael Baker, Jr., (Rochester, Pa.) and Aero Service Corporation (Philadelphia)	207 miles
J. E. Greiner (Baltimore)	100
For *design* of Interstate routes (88 miles assigned; other routes being negotiated):	
Michael Baker, Jr., (Rochester, Pa.)	25 miles
J. E. Greiner (Baltimore)	14
Vogt, Ivers, Seaman & Associates (Cincinnati)	14
Frank McEnteer (Clarksburg, W. Va.)	7
John F. Meissner (Chicago)	7
Richardson, Gordon & Associates (Pittsburgh) and Aerial Map Service (Pittsburgh)	7
J. Stephen Watkins & Associates (Lexington, Ky.) and Aero Service Corporation (Philadelphia)	14
For *location* of Primary System routes (521 miles):	
Alster & Associates (Washington, D. C.)	140 miles
Erdman, Smock & Halsey (Washington, D. C.)	105
Fairchild Aerial Surveys (Los Angeles)	80
L. Robert Kimball (Ebinsburg, W. Va.)	68
J. E. Meissner (Chicago)	140

News about Allis-Chalmers construction machinery . . .

Tractor power helps build Navajo Dam...40 stories high

Morrison-Knudsen Co., Inc. is sponsoring contractor on the Navajo Dam job in a joint venture with Henry J. Kaiser Co. and F & S Contracting Co.

Right now, the dam you see here exists only in the minds of its builders. Spanning a sun-baked canyon in New Mexico, it will create a lake 37 miles long . . . enough water to irrigate many thousands of thirsty acres. But towering Navajo Dam, one of the world's largest earth-fill structures, will take four more years to complete. Sponsoring contractor is world-famous Morrison-Knudsen . . . already moving the first of 26 million yards of dirt and rock that will test tractor performance and dependability as severely as any job can. M-K's choice — big Allis-Chalmers crawlers with turbocharged diesel power, hydraulic torque converter drive, and the toughest track ever made. Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Construction Machinery Division • Engine-Material Handling Division • Farm Equipment Division • General Products Division • Industrial Equipment Division • Nuclear Power Division • Power Equipment Division • Allis-Chalmers International

POWER **FOR A GROWING WORLD**

OVER

How it will look—The finished dam will be 3800 feet wide, 3200 feet thick at its base . . . and will create the biggest body of water in New Mexico.

picture report.....

Allis-Chalmers big HD-21's get Navajo Dam under way

24-foot-wide dozing team—Torque converter HD-21's match power and speed precisely, as they work together to push huge mounds of dirt and rock over the cliff to prepare for construction of a spillway.

No worries about river work—Positive-seal protection of vital track parts lets the HD-21's doze rock from the river bottom to form approaches for a temporary bridge without fear of lubricant loss or track damage.

Heavy-duty power for heavy-duty haul roads—Big Allis-Chalmers Forty Five motor graders fit the Navajo job to a "T." Clean, uncluttered design lets operator see both ends of the moldboard easily as he cuts a roadside ditch.

Four plus yards at a crack—This Allis-Chalmers HD-21G, biggest tractor shovel available anywhere, is helping to load about 40,000 yards of rock and dirt to clear the way for construction of a diversion tunnel.

See for yourself why Allis-Chalmers equipment was chosen for the Navajo Dam job. Your Allis-Chalmers dealer will demonstrate machines to fit your requirements . . . on your job—no obligation. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin

ALLIS-CHALMERS ***POWER*** **FOR A GROWING WORLD**

Litho in U.S.A.

4:30 p.m.

Conditions hazardous

5:15 p.m.

Rush hour traffic moves safely

COLUMBIA CALCIUM CHLORIDE

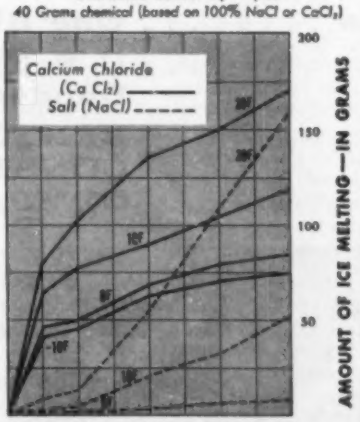
makes streets and roads safe faster

Speedy ice and snow control keeps towns and highways running smoothly, holds fatalities and injuries down. And here are new test results proving once again that Columbia Calcium Chloride brings safety to surfaces *faster*. This skid-proofing chemical melts *8 times as much ice* within thirty minutes after application as is melted by salt. Here are comparative results over a two hour period: ▶

Better order an ample supply of Columbia Calcium Chloride today through your nearest Columbia-Southern District Sales Office.

AMOUNT OF ICE MELTED
15 TO 120 MINUTES

350 Grams ice in 7" by 11" pan
40 Grams chemical (based on 100% NaCl or $CaCl_2$)



NOTE: NO reaction with salt at —10 F.

Columbia Calcium Chloride is available in both High Test Flake (94-97% $CaCl_2$ content) and Regular Flake (77-80% $CaCl_2$).

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte
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San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

Safeguard Winter Traffic with Columbia Calcium Chloride

. . . for more details circle 262 on enclosed return postal card

Here is the BUTLER PLANT with which Denton Construction Company set a new world's record.

WORLD'S HIGHWAY BATCHING RECORD!

IN ONE DAY 6,029 LINEAL FEET

This is a record announced by the Michigan State Highway Department on behalf of Denton Construction Company

- **Paving time** . . . . . **12 hours**
- **Batching production** . . . . . **2,968 batches**
- **Cement consumption** . . . . . **5,800 barrels**
- **Paving Production** . . . . . **6,029 feet** *(length)* **x 24 feet** *(width)* **x 9 inches** *(thickness)*
- **Square yards** **16,077**
- **Cubic yards** **4,019**
- **Number of pavers** . . . . . **Three 34E dual drums**
- **Number of batching plants** . . . . . **One BUTLER TX-4**
- **Site** . . . . . **U. S. 23 near Dundee, Michigan**
- **Contractor** . . . . . **DENTON CONSTRUCTION COMPANY**

Do you want to know more about the BUTLER TX-4 and its versatility in production? Just write "TX-4" on a postcard with your name and address. We'll rush complete details immediately.

Notice that 3 pavers were used. The BUTLER TX-4 can readily satisfy 4 dual drums. What would the record be if 4 pavers had been on that job?

But interestingly, the BUTLER TX-4 is efficient and economical where a job requires only ONE PAVER. Just a matter of the number of batchers and their arrangement.

BUTLER BIN CO.

959 Blackstone Avenue • Waukesha, Wisconsin

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Colorado Conference

(Continued from page 63)

In most instances, each county in attendance is represented by three commissioners and from one to three road foremen. This keeps the groups conveniently small—important since the conference areas contain from 5 to 13 counties. Since attendance by county officials is voluntary, the consistently good turnout gives evidence that the area conferences have been successful in promoting interest and obtaining knowledge about highway techniques.

Topics Planned Ahead

Questionnaires serve the double purpose of preparing the agenda for the meetings and stimulating voluntary attendance. From them, the district engineers arrange the programs and schedule persons from the department or other agencies to answer questions or lead discussions. A selection of topics culled from question sheets returned this year will indicate how widely these conferences must range over the whole highway field:

- Discuss different types of snow machinery, suitable for graveled roads and mountainous terrain. Which are most economical in labor and time?
- Weed control in winter—tumble weeds piled against fences.
- What is the state's obligation on access to freeways where a county road is cut off?
- Stabilization (including salt) of dirt and gravel roads.
- Advisability of seal-coating oil-mixed paving the same season as laid.
- "How come" our county is the only one in the state that received less from the Highway Users' Fund than last year?
- What is the proper size of gravel used effectively in road surfacing? To prevent frost boils?
- We need a discussion of snow removal at railroad crossings.
- What's the highway law in relation to cattle along the highways?
- How can we construct a high class road where the water table is about 12 inches from the surface?
- Reports wanted on slurry emulsion and latex-coat experiments.

As the schedule of state-county meetings has progressed, we have found that many of these questions —and especially the "hottest" ones— can best be handled by panels of county representatives leading the discussions. This gives the county people freedom to "let their hair down" on matters in which the department and local governments are mutually concerned.

In presenting information, the state's district engineers and their staffs have made extensive use of color slides, photos, film strips, and industrial and educational movies. When practical, state and county maintenance superintendents meet together to inspect the state's mobile equipment and repair shops.

State officials believe that the highway conferences would justify their existence if they provided only constant reviews of highway law necessitated by the changes made in Colorado's legal road setup by the Act of 1953. This altered the apportionment of the Highway Users' Tax Fund and made radical changes in the operation of both the state and county highway departments.

The highway laws are reviewed at the area conferences at least every two years, as an introduction for new commissioners and a review for the others. The department issues copies of Colorado's highway laws and related statutes to each county for reference. Supplements are provided as changes are made by legislation.

Design Discussed

The commissioners review methods of simplying reporting receipts and disbursements from the County Road and Bridge Fund to the state auditor, and study new bookkeeping procedures. They hear Bureau of Public Roads staffers in explanations of the Federal Aid Act of 1944, which, with supplemental legislation, requires concurrence of local officials in selections and changes in Federal Aid secondary routes and construction projects thereon using Federal funds. And they are reminded of the department's policy of making the services of materials engineers and laboratories available to counties for tests of highway materials.

The county commissioners also learn that the department's staff will make recommendations for proper use of both natural and artificial additives necessary for sound roadway foundations and surfacing. Major design features have been presented and discussed at the meetings, supplementing the department's making available plans for standard bridges upon request.

Cooperation by the state press has helped to convince the public in Colorado of the important role played by the county in state highway matters.

West Virginia Highway Program

(Continued from page 70)

would provide the coverage required.

Michael Baker, Jr., of Rochester, Pennsylvania, had a big chunk of the preliminary engineering job—165 miles of proposed highway—comparing alternate routes, recommending order of construction, and estimating future traffic requirements. Part of this project included mapping the entire city of Charleston—all streets, buildings, vegetation, and structures. (There were as many as 5,000 structures within some of the 2-mile square photographs.)

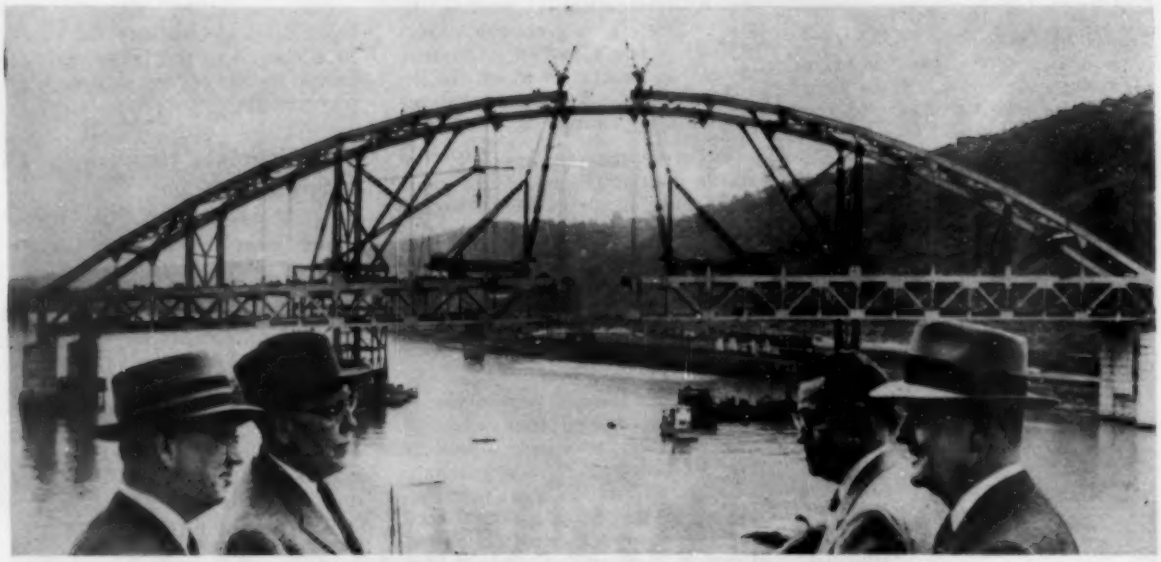
The nature of the West Virginia construction task being brought closer to reality is apparent in one of Baker's design assignments. The future construction job in this 31.4 mile segment will call for 15.5 million cubic yards of excavation, 7 major interchanges, and 35 bridges ranging up to 1,334 ft. in length. This route runs through some of the roughest and yet densely built-up areas in West Virginia, and will give the contractors some real problems.

Years Are Being Saved

Right now, the engineers are up to their ears in location and design plans. If they had depended upon traditional methods, the 828-mile job would still be *years* away from the construction stage. But thanks to the aerial camera, the Tellurometer, igenious plotting devices and electronic computers, mobilized into action by trained specialists, millions of dollars worth of new road construction will soon be ready for awarding in West Virginia.

(Editor's Note: Designers of the Tellurometer have emphasized the accuracy of their device in distances over 1,000 ft., but heretofore have cautioned that an inherent error in each instrument of up to plus-or-minus 2 in. might limit its use for shorter distances. It has been revealed, however, that this error can be largely calibrated out of each instrument.

As the Meissner crew discovered, this calibration simple adjustment makes the instrument of considerable more value for field survey. For example, on a section of one of the traverses mentioned above, 49 "shots" were made. Their average length was only 900 ft., (and some were as short as 340 ft.) but closure was made at an accuracy of 1 part in 32,000.



● Novel span at Pittsburgh being inspected by men who played major roles in making the new Fort Pitt Bridge a reality: Allan A. Porter, American Bridge Division's vice-president-erecting; George S. Richardson, consulting engineer, designer of the bridge; Leonard J. Curran, district engineer, Pennsylvania department of highways; and Arthur S. Marvin, American Bridge Division's vice-president-engineering.

Mostly High Strength Steel—

UNIQUE DOUBLE-DECK TIED ARCH

Complex stress analysis problems solved by electronic computers. High strength steel comprises two-thirds of fabricated steel weight.

FEATURING a profile of high strength steel, the new Fort Pitt Bridge across the Monongahela River at Pittsburgh, Pa., is designed around a combination of engineering principles that make it the only span of its type in the world. The structure is being erected by American Bridge Division of U. S. Steel Corporation, as a link in Pittsburgh's Penn-Lincoln Parkway System.

At one stage of design and planning, structural engineers on the staff of George S. Richardson, consulting engineer for the Pennsylvania department of highways, conducted tests and analyses to determine the stress pattern of the unusual bridge. To span the entire width of the river in compliance with navigation requirements and at the same time achieve aesthetic appeal, designers selected a double-deck, tied-arch structure. The bridge will carry four lanes of one-way traffic on each level.

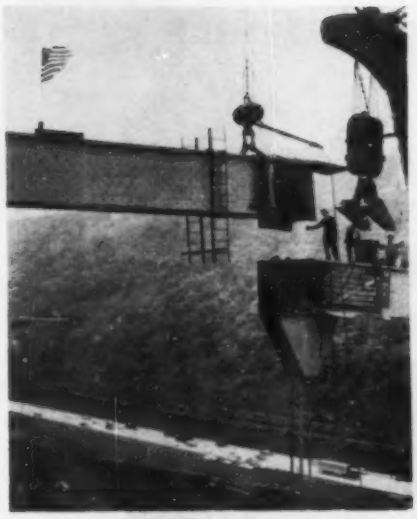
The George S. Richardson design emerged as the world's only double-deck bridge using box sections as arch ribs and with the tied-arch using trusses instead of girders as ties. Specifications called for high-strength steel components in more than two thirds of the 750-ft. span's total weight of 8,500 tons of fabricated steel.

During the preliminary design stage, a 100 to 1 scale steel model was built and tested at the Thayer School of Engineering of Dartmouth College. Strains were measured by SR-4 electronic strain gauges, and deflections by Ames dials. As a result of the model tests and other studies, it was determined that a multiple indeterminate analysis was necessary.

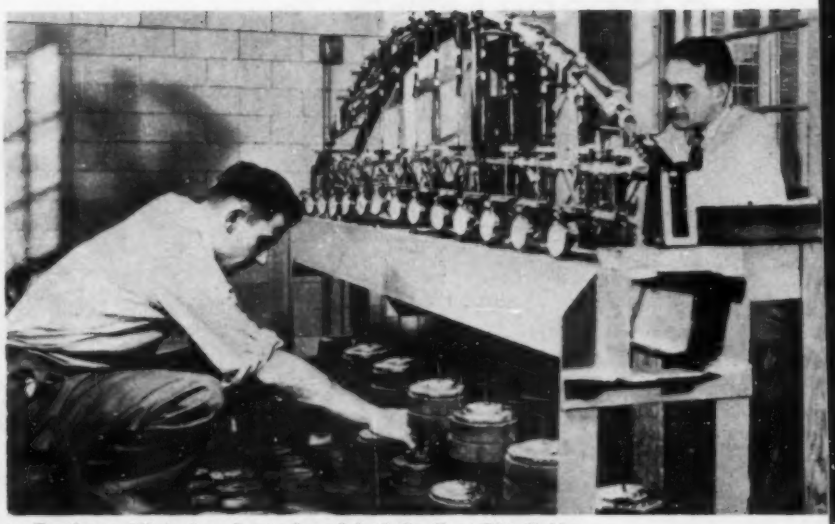
In general, the engineers sought to determine stresses roughly equivalent to those present in an archer's bow. In a tied-arch bridge design the roadway truss acts as the bowstring to hold the "bow" section of the bridge arched and properly distribute loads and stresses.

The final design called for solving 15 simultaneous equations—14 for hangar points and the 15th for horizontal continuity. The work was aided by American Bridge Division's electronic computer.

Stress was an important cost factor in materials specifications. With design requirements resolved, high-



● **Suspended 222 ft. above the Monongahela River, 50-ft. long USS Man-Ten high strength steel bridge section about to close the arch on the 750-ft. span. The 90-ft. boom cranes hoisted the high strength steel center section from a barge floated below.**



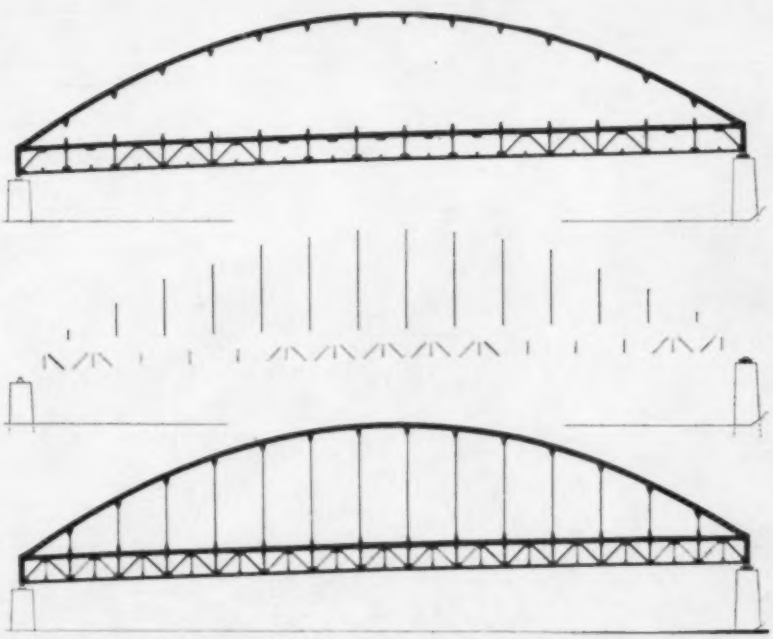
● **Testing a 100 to 1 scale steel model of the Fort Pitt Bridge.**

strength steel answered the problem of getting more stress per dollar where stronger steel was needed. High-strength steel was specified where the stress ratio of high-strength steel over structural carbon steel was higher than the price ratio.

In fabricating and erecting the Fort Pitt Bridge, American Bridge Division used USS Man-Ten Steel in all portal members including end floor beams, all chords, and most diagonals and verticals.

USS Man-Ten Steel with 50% greater strength than structural carbon steel served a cost savings purpose in erection. Man-Ten was used in some diagonals to withstand erection stresses. Had structural carbon steel been used in the same places it would have been necessary to go to the expense of reinforcing the diagonals until the bridge was completed.

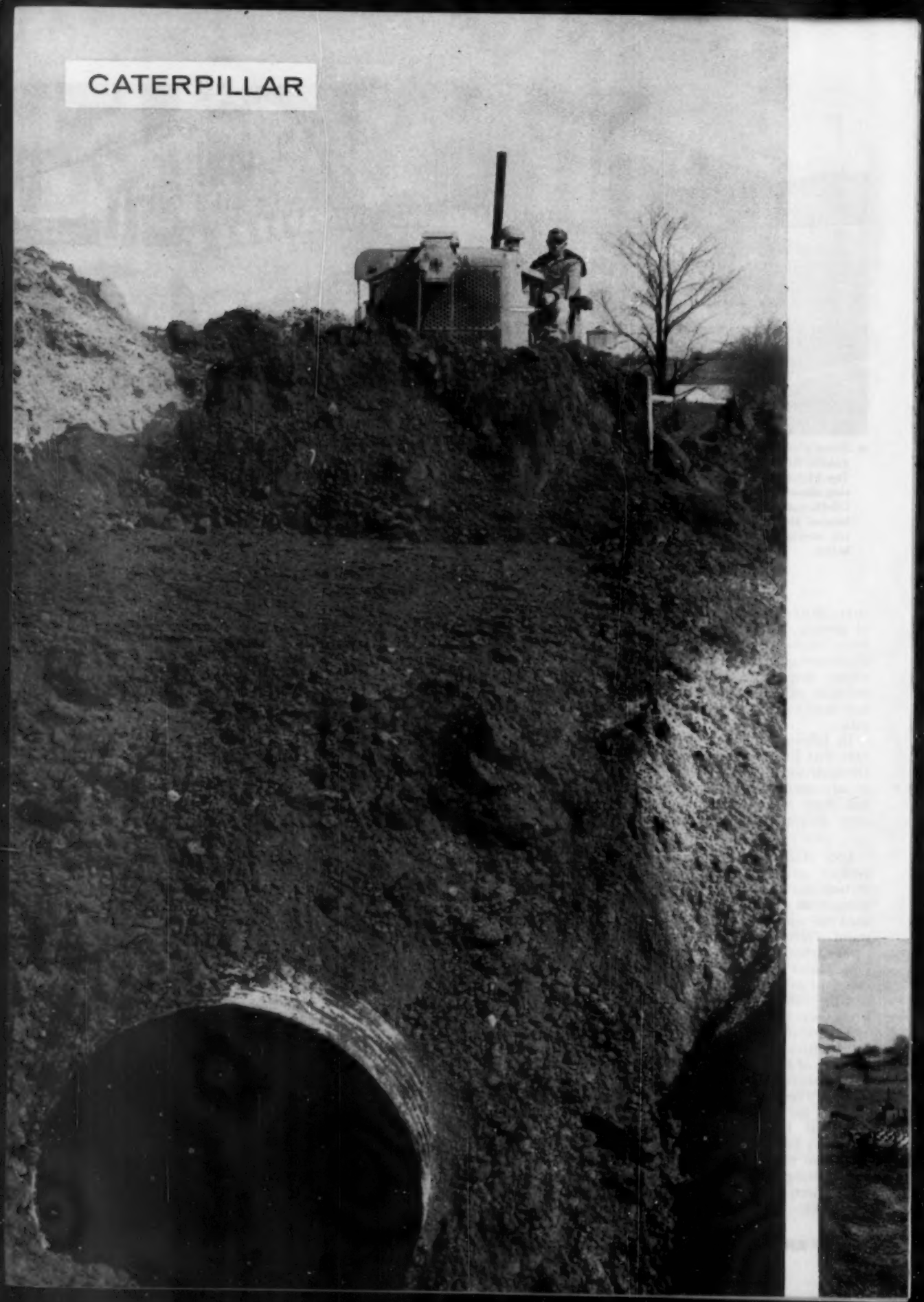
A similar span, the Fort Duquesne Bridge, also featuring extensive use of high strength steel, will be constructed over the Allegheny River. The Fort Pitt Bridge will serve as the link between the east and west Penn-Lincoln Parkway. The Fort Duquesne Bridge will be the major route to areas northwest of Pittsburgh and ultimately will be connected to the Pennsylvania Turnpike.



● **Top section of this 3-panel bridge drawing shows the high-strength steel profile of the Fort Pitt Bridge—the end floor beams, all arch chords, and all of the truss members except a few diagonals and verticals. Lines in the center section show other steels used. Vertical lines represent the bridge suspender cables, each of four 3¼-in. wire ropes made by U. S. Steel's American Steel & Wire Division. The lines directly above and between the end piers represent structural carbon steel bridge parts. The lower section is a composite showing all steel componets.**

● Construction safety effort is now turning more and more to the avoidance of electrical accidents, according to the National Safety Council. With highway work becoming more urbanized, and in contract more frequently with power lines—and with use of electrical equipment on construction growing—the contractor needs to see that this phase of job safety is well managed.

Contractors wishing information should write the National Safety Council, Construction Section, 425 N. Michigan Avenue, for data.


CATERPILLAR

INTERSTATE HIGHWAY SYSTEM

REPORT FROM OHIO:

Contractor tools up with Caterpillar equipment for his biggest job

Wilson H. Rownd, Vice President of General Asphalt: "Our Caterpillar equipment has always done its job without our babying it. Those DW21-No. 470s are fast loading and big producers. We've had very little down time. Our operators prefer Caterpillar — and so do we."

"What equipment do I need to do this job profitably?" That's the first question a contractor asks when he gets a large contract. And Caterpillar provides the answer to most successful contractors. Here's what happened recently on a highway project in Ohio.

Relocation of 5.632 miles of U.S. 62 between Millersburg and Berlin was awarded to the General Asphalt Paving Co. of Canton for a low bid of $1,091,095.04—the largest earthmoving contract in the firm's 38-year history. It involves moving 511,000 cu. yd. of earth, clay and shale.

To beef up its fleet, General Asphalt purchased three Caterpillar DW21 wheel-type Tractors with No. 470 LOWBOWL Scrapers, and a Cat D9 track-type Tractor with No. 9S Bulldozer and No. 9 Ripper. Other Caterpillar equipment on the job includes four D8s, a D2 and a No. 6 Shovel.

This project is part of the ABC System of roads that supplements the planned 41,000-mile National System of Interstate and Defense Highways. As work gets under way on this greatest construction job in history, more and more contractors are standardizing on Caterpillar equipment. A recent survey of the $415 million Illinois Toll Highway showed that 53 per cent of the equipment at work was Caterpillar.

These contractors have found that for profitable production you can't beat the combination of good machines and good dealer service. Your Caterpillar Dealer can help you to a profitable low bid by showing you how to figure on the high productivity of the big, yellow machines. Ask him today to demonstrate on *your* job. It's the best way to make sure you get your share of highway work.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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Cat D8 Tractor, left, bulldozes on highway relocation project. Below, a DW21-No. 470 unloads behind a D8 pulling a sheepsfoot roller. Scraper cycle is 4,800 ft.

Three other D8s and a D9 also rip and push-load. Fleet averages 6,000 cu. yd. of earth moved a day. Roadbed will be 40 ft. wide. Contractors agree Cat-built machines are dependable.

HOW MUCH DID THIS BLAST *COST?*

(From a technical bulletin prepared for users of explosives by the Technical Division, Atlas Powder Co.)

A blast for a highway grading job or for aggregate production costs a lot more than the price of the explosives which went into making it. Somebody had to buy or rent a drill to sink the holes and pay drillers to run the drill. Somebody had to purchase the equipment to dig the rock and run it through a crusher or haul it somewhere for fill or riprap or jetty stone. The value or cost of the blast will depend on how well the rock is broken to meet the purpose for which it is intended.

The blaster might save a few bucks on the price of explosives, and that saving might be real and show up in his profit picture. On the other hand, he might save a few bucks on explosives and have to spend many bucks on extra drilling or tough digging, on trucks waiting for the shovel, on extra mainteance of shovels, trucks and crusher.

Cost Chart Does the Work. Users of explosives have known for a long time that the only way to find the *true* blast cost is to take *all* the factors influenced by the explosives action and bring them down to a definite cost per yard or ton of broken rock.

The problem has been to do this without taking too much valuable time from a busy superintendent's working day. The Atlas Powder Co. has developed a Blasting Cost Chart which helps do the job quickly, and uniformly, so that the cost of different blasts can be compared for an overall profit picture.

When you have assembled the facts regarding any blast, or the blasting for a given period the Blasting Cost Chart enables dividing costs into the five cost divisions which reveal *the work done by the explosive.* These are as follows:

Drilling. Since some explosives require fewer or smaller holes than others, no record of blasting cost is complete unless it takes into account the actual cost per foot of drill hole and relates this to the drilling cost per yard or ton of rock.

Cost figures here should include amortization of drilling equipment, labor, maintenance, bits and steel and the cost of fuel or power needed to operate the drill.

Primary Blasting. Although everyone keeps track of their powder bills, only a few operators keep an accurate record of the time spent in loading the blast and smaller cost factors involved in loading and blasting.

But if the primary explosives or blasting method demands extra labor time for mixing or handling, accuracy demands that these costs be taken into consideration.

Secondary Breakage. This section would not apply to coal stripping because in this field a shot either digs or it doesn't. If it doesn't, it's usually a total loss because further work on the overburden would be more expensive than the coal underneath is worth. But other mines, quarries, and construction jobs have to work over their broken stone. When this is necessary the labor and equipment involved are a definite cost factor, sometimes a serious one, whether the work is done by drilling and shooting or with a drop ball.

Sometimes an improved method of primary blasting or different explosives in the primary blast can virtually eliminate secondary breakage.

Digging, Hauling and Crushing. If a shovel spends many short periods a day scratching for useable stone in the muckpile, if the trucks line up

CHECK QUESTIONS FOR ANALYZING ROCK EXCAVATION METHODS

Drilling

- Are we using the right kind of drill and best possible spacing and burden for our rock?
- Could we save money by pulling our holes in and using a lower grade explosive?
- Would we save more by spacing our holes wider and using a higher strength explosive?
- Could we save money by contract drilling our holes rather than amortizing our own drill?

Explosives

- Is this grade of primary explosive the most economical for our rock?
- Would we save money in secondary work, digging and crushing if we shot the primary blast harder?
- Is our labor cost excessive for a blast of this size?
- Is our cost of secondary breakage higher than it should be for the quantity of rock we produce?
- Did loading or blasting impede other activities?
- Are we using the most efficient means of initiating our blasts?
- Is our point of initiation correct?

Digging, Hauling, Crushing

- Would better rock breakage or a lower muck-pile lessen labor time or shovel maintenance? Could this be obtained by changing drill pattern, type of explosive or method of firing?
- Did we lose any orders, or pay penalties due to production falling behind demand or schedule?
- Are we blasting the maximum amount of usable rock? Do fines or boulders lessen our profits?

General

- Does any step in shooting or handling make us vulnerable to vibration complaints, costly lawsuits or accidents which could wipe out our savings?
- Are we doing everything possible to promote both safety and good public relations?

waiting for the shovel, if maintenance on shovel, trucks and crusher varies from blast to blast—their time and labor costs can swell much bigger in the balance sheet than the total cost of the primary blasting.

Since explosives efficiency can only be measured by results, the cost figures for digging or scraping, hauling or casting, and for crushing (if done) must be computed, at least until it is determined there is little or no variance in these costs from blast to blast.

Miscellaneous. This cost classification allows for inclusion of special insurance costs, overhead or supervision time. It's not necessary to use this unless changes in method or explosives influence the time or money spent.

The more accurately the cost per ton or yard is figured for each of these classifications the better a user of explosives can judge which explosive or which blasting method to use in his own operation.

The Blasting Cost Chart looks like a lot of work when it's tackled for the first time, but as fixed cost figures are established and the operator becomes used to relating these to blasting, this simplified accounting system requires little management time and pays off in factual knowledge of comparative costs.

(Editor's Note: Readers wishing a copy of the cost chart and related instructional material should address Explosives Division, Atlas Powder Company, Wilmington 99, Delaware).

PAVING RECORD

(Continued from page 62)

the third paver, the train consisted of a Jaeger combination finisher-spreader (with screw and oscillating screed); a Heltzel combination finisher and bull float; hand checking with two 16-ft. long handled straightedges; insertion of transverse joints; and the Heltzel spray cure machine. Clipper saws were used for longitudinal dummy joints.

● *Not Best Season.* This outfit began its U.S. 23 relocation paving in July, after previously handling two small projects of 150,000 and 60,000 sq. yd. of concrete. The 242,000 sq. yd. of the U.S. 23 project was scheduled for completion, including ramps and connecting road yardage, in time to move to a fourth location and make a start before winter.

Actually the Denton management is none too happy over the 1958 accomplishment, which is expected to fall short of the million square yards or more normally hoped for each year. Michigan had a very bad 1957-58 winter, followed by a wet spring and summer. The grading often wasn't on schedule and paving was delayed for this reason, as well as during rainy summer days.

● *Acknowledgments.* The record-setting spread was under the field direction of Michael Palmer, project manager. *Peter Branstrom* was project engineer for the Michigan State highway department. John C. Mackie is Commissioner of Highways.

● Steel in modern highways will average about 500 tons per mile, reports the American Iron and Steel Institute. This figure pertains to primary and interstate highways. For lesser rural roads the tonnage will be about half this figure.

Structural shapes count for about 40% of steel tonnage for the past two years going into the highway program with steel plates another 20%. Steel piling represents 16% and concrete reinforcing bars 12%.

He moves big yardage on housing development

with two self-loading 7-yd Allis-Chalmers motor scrapers . . . hauling 1,500 to 3,000 feet

K. L. Perry
K. L. Perry Excavating Co.

On a new development location for a big residential subdivision, K. L. Perry Excavating Company of Kansas City, Missouri, has found a new and profitable earth-moving team—two Allis-Chalmers TS-160 motor scrapers. Perry bought them on the basis of a demonstration which proved their maneuverability, speed and ability to self-load. Now the TS-160's have sold him on dependability and economy, too.

One of Perry's self-loaded TS-160's leaves the cut as the other returns to keep up the 1,000-yard-a-day pace on Vineyard Woods job.

Look ahead... *move ahead*...and stay ahead with

Short turning radius (less than 25 ft) and positive hydraulic control make maneuvering through tight spots a simple operation for Perry's TS-160's.

The TS-160 is the only motor scraper near its size available with forced ejection and extra high apron lift that assures easy ejection of toughest material.

TS-160's move dirt faster... cut operating costs in half

Earth-moving operations in modern housing developments have to move fast to keep costs low . . . and to set the pace for production line methods in home construction. On the Vineyard Woods job, for instance, to maintain the building program, Perry had to average 500 cubic yards per day, hauling up to 3,000 feet.

His two Allis-Chalmers TS-160 motor scrapers handled it with plenty to spare. Self-loading, they frequently topped 1,000-yard production daily. At the same time, operating costs were cut in half compared to his previous equipment. Perry says his Allis-Chalmers motor scrapers are big producers . . . helped him finish contracts days ahead of schedule. He now bids and makes a profit on contracts he couldn't consider before.

Self-loading, compactness and maneuverability make TS-160's naturals for development work

Primary factors in Perry's choice of Allis-Chalmers TS-160's were their demonstrated high-speed and self-loading ability. However, since he's had them, other benefits have become apparent. Perry is particularly pleased with their maneuverability. They turn in less than 25 feet—a valuable timesaver in limited space on many housing development operations. Hydraulic power steering makes maneuvering in tight quarters easy and efficient.

They also save time and money between jobs . . . move on highway at up to 25.4 mph. Operator comfort and ease of handling were noted as outstanding by Perry and his crew.

Performance sold the machines... dependability proved their value

K. L. Perry checked them all when he was in the market for high-speed dirt-moving equipment. He says, "We were sold by demonstration that the Allis-Chalmers machines were best—but the real proof came with performance like we had on the Vineyard Woods development in Kansas City. We've had only routine maintenance on the machines in eight months since we bought them. They put us in position to get the 500-home Kentucky Hill job at Independence, Missouri."

This TS-160 motor scraper story is a good example of the value in talking things over with your Allis-Chalmers construction machinery dealer. He knows the earth-moving business and can help you choose the machines that will help you most. Ask him for a demonstration right on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

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Mack Model LVX—22½-ton payload rear dumper.

Mack Model LRX—15-ton payload rear dumper.

Send a man instead of a boy!

Big yardages—smashing impacts—heavy hauls. That's when you need a truck with the guts and go of these famous super-capacity Mack off-highway dumpers. No doubt about it, the man-sized jobs are the Mack-sized jobs.

Check the specs with your Mack representative—but remember, Mack quality begins where specifications leave off. And be sure to ask him about Mack users—names, facts and figures—who are handling their big jobs with these profit-earning big Macks.

Mack Trucks, Inc., Plainfield, New Jersey.
In Canada: Mack Trucks of Canada, Ltd.

For capacities of 30 tons or more where maximum flotation and traction are required, a full line of tandem rear axle Macks is available.

MACK
first name for
TRUCKS

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Contractor Qualification—

New Data on State Highway Practices

The Bureau of Public Roads recently surveyed policies of the various state highway departments on the subject of "Contractor's Qualifications." Following are the highlight results, as announced by M. B. Christensen, Chief of the Bureau's Construction Office of Engineering.

OF THE 51 highway departments, including Hawaii, Puerto Rico and the District of Columbia, 38 require prequalification by contractors prior to their receiving proposal forms for formal bidding. A number of these states will, however, furnish to a bidder, previously not qualified, plans and proposals marked "not issued for bidding purposes" so that the contractor may familiarize himself with the proposed work during the time his qualification papers are being processed.

Of the remaining 13 states, 8 permit qualification at the time bidding proposals are presented at a letting, to be acted on before award can be made, and 5 require post-qualification.

• *Assets Required:* Several states do not have established formulae to determine the extent of contractor qualification and a few require liquid assets in the amount of 10 percent to 25 percent of the total bid. Twenty-seven states have established factors ranging from 2 to 10 times the liquid assets. Most of these states use factors of about 5 to 7 times the liquid assets. Additional allowances for equipment, made by a small number of these states, range from actual book value to as much as five times the book values with consideration given also to types of equipment.

The contractor's experience and personnel employed are also evaluated in processing contractor's statements. Most states deduct the estimated value of uncompleted current work from the capacity rating assigned to any particular firm when considering awards.

The period of time required for state action on qualification statements ranges from 3 to 30 days, and the time interval between the submission of qualification statements and opening of bids ranges from 3 to 20 days in states requiring prequalification. Most states normally require 7 to 10 days to act on qualification statements but will allow submission of statements up to within 5 to 7 days, or less, prior to lettings and act on them in sufficient time that a contractor, if judged qualified, can be notified in time to submit his bid. In some instances states have approved applications in as little as one day or even a few hours when no difficult questions were involved.

• *Federal-Aid Requirements:* Conditions applicable to contracting for Federal-aid highway projects undertaken by the state highway departments are cited in the following paragraph.

Paragraph (d) of Section 1.10 of the Federal-aid regulations provides in pertinent part that no procedure or requirement shall be approved which, in the judgment of the Secretary of Commerce, is designed or may operate to prevent the submission of a bid by, or the award of a contract to, any responsible contractor, whether resident or nonresident of the state wherein the work is to be performed. Such preventive effort applies here as laws or regulations which require the licensing of a contractor before he may submit a bid or which prohibit the consideration of a bid submitted by a contractor not so licensed; or rules which govern the prequalification of contractors by which the amount of work that may be awarded to a contractor is limited otherwise than by a full and appropriate evaluation of his experience, equipment, financial resources, and performance record.

To support these Federal-aid regulations and in the belief that such procedures would be beneficial to the state highway departments and the contracting industry if followed on other than Federal-aid work, the Bureau has urged the states to consider the following matters.

(a) Revise any existing state requirements that tend to be contrary to Federal-aid regulations.

(b) Decrease the time required to process qualification statements if possible, so that any interested contractor, not already qualified, will have ample time after a project is advertised to submit appropriate questionnaires and receive results of the state's evaluation in time to bid on any specific project.

(c) Increase the advertising period if need be, to allow ample time for job evaluation by contractors.

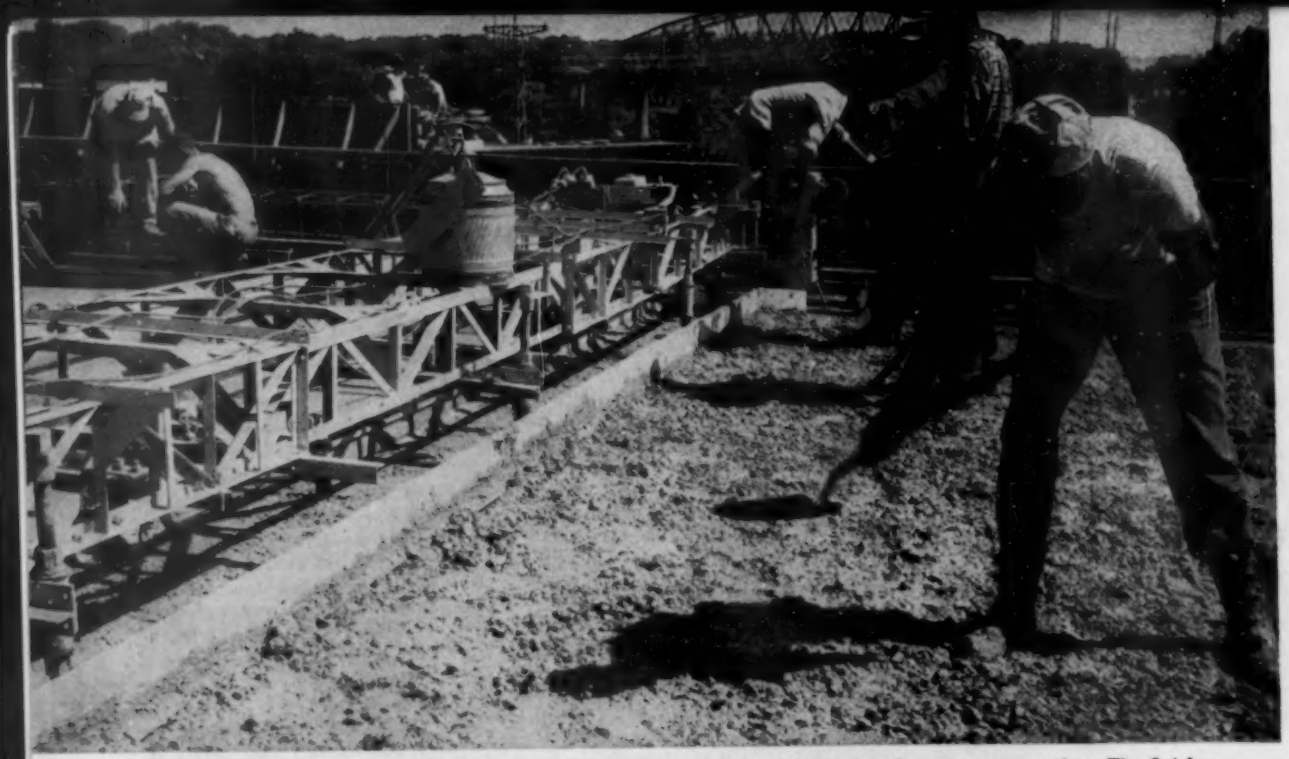
(d) In considering the volume of unfinished work currently under contract to apparent low bidders, take into account the types of work and the sequences in which the work can be performed. Types of work that must necessarily be delayed for considerable periods because of normal construction sequences should not necessarily be deducted from the contractor's capacity rating.

(e) Consider letters of credit as capital assets in reviewing and analyzing contractors' questionnaire statements.

(f) Some states require prequalification of subcontractors. This procedure tends to guarantee competent assistance to prime contractors in the performance of work on large contracts. Other states consider that as prime contractors are responsible this procedure is not necessary. It has been recommended that states give consideration to extending prequalification requirements to subcontractors, if it will assist in expediting approvals when a prime contractor proposes subletting any of his work.

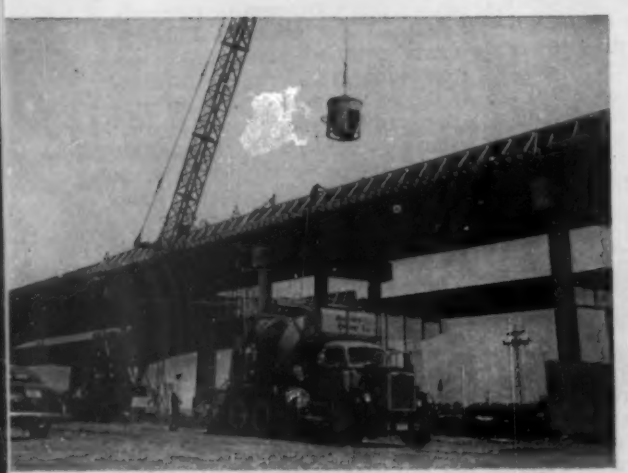
(g) Where handling of the contracts is through delegated authority from a state to counties, cities, utility companies, etc., if their qualification and other procedures are not consistent with the established policies and procedures used by the state highway departments, the Bureau has recommended that—to avoid unsatisfactory construction performance—consideration be given to requiring full compliance by such authorized agents with all state procedures and requirements.

• Over a hundred vehicles were refused passage on the Pennsylvania Turnpike during a recent 3-month period, due to unsafe conditions. Reasons included improper towing, faulty lighting, improper load or oversized vehicle, or bad tires (plus two, intoxicated drivers).

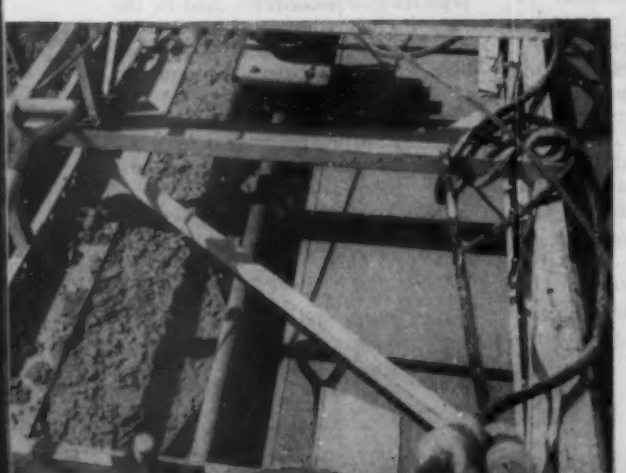


● A Master bridge deck finishing machine being used across entire width of a two-lane span at one time. The finisher rides on pipe rails and is pulled forward by hand operated winches on either end of the machine.

Wide-Span Vibrating



● 11,775 cubic yards of deck concrete was delivered to the job in transit mixers. Signalman up on the bridge guides the crane operator so that concrete could be dumped where needed.



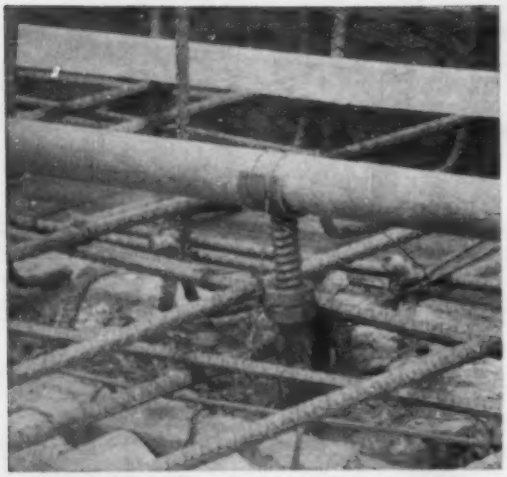
● Looking down on the strike-off and vibrating beam — showing how the front strike-off meters concrete to the L-shaped vibrating beam. Note the good finish behind the vibrating beam and the grout which has been brought to the surface. Hand finishers don't have to worry about stones in the surface.

The contractor building the largest bridge on the Northern Illinois Toll Highway used a new vibrating finishing machine designed especially for bridge decks and elevated highways.

The joint venture of Condon-Cunningham Company, Peter Kiewit & Sons Company, and Paschen Contractors, Inc., erected a twin, double lane 4,935 ft. bridge over a river, two canals, a railroad line and a railroad yard. The deck, laid on both steel and precast, prestressed beams, was 7½-in. slab consisting of 11,775 cu. yd. of low slump (2—2½ in.) concrete.

Two of the new Master finishers were used on this job. With striking off, compacting and vibrating being accomplished in a single pass, the contractor was able to lay and finish up to 265 ft. per day with one machine.

The new wide-span finisher had a strike-off blade, followed by a beam-type vibrator and a "Grade Checker" at the rear—the latter to provide a constant check on grade



● Pipe holders for adjustable screed supports, welded to reinforcing iron in top of concrete beams.

● Tollway's twin double-lane spans across the Chicago Sanitary and Ship Canal, where wide-deck finishing equipment described here was used.

Unit Finishes Tollway Bridge Deck

and aid in aligning the machine during the first few feet of travel.

The 3,000-lb. finisher rode on 1⅞ in. pipe rails which were supported by screed chairs placed 30 in. apart. The rails were set so that the finish grade of the concrete was just at the underside of the pipe. The adjustable screed chairs and pipe rails were removed after the finisher passed by, leaving only some hand touch-up work on both sides of the slab.

The unit moved ahead by means of low-geared, hand operated winches on either side. Accurate grade and crown were maintained by screw adjustments on the front strike-off. The actual weight of the machine on the rails was reduced when applied to the concrete surface because of the buoyant effect of the concrete below the strike-off and vibrating beams.

Electric motor-in-head vibrators were used ahead of the finishing machine to help spread the concrete.

The contractor used plywood forms for the deck on the steel spans, and a stay-in-place corrugated metal form on the concrete beams. Transit mix concrete was used entirely for the deck.

Project superintendent is Jim Wilson. Consulting engineers are Maccabee-Campbell & Associates.

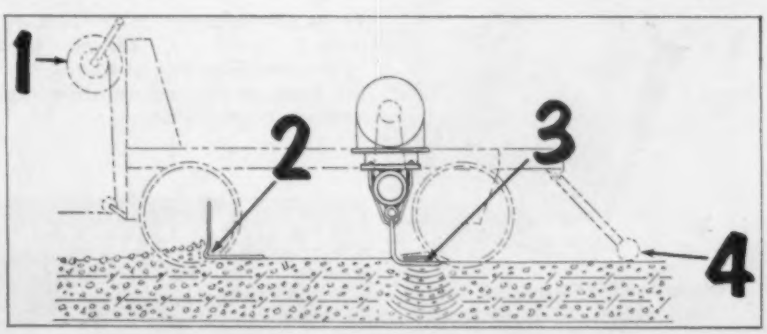
How the Finisher Does the Job

1. Uniform forward travel is provided by low-geared winches on each side of the machine. For hooking on to the bulb angle, reinforcing rods, or any other convenient anchorage. Cable is reeled in; machine pulls itself forward.

2. Front strike-off is set ½ in. above grade and meters the concrete to the beam-type vibrator. Adjustment up and down can be made quickly.

3. Compaction is provided by "L" shaped beam-type vibrators. These are set ¼ in. below grade; compaction lowers the concrete to exact grade. Maximum vibration through entire slabs insured due to "whip" action of trailing edge. Adequate grout is brought to the surface for any final finishing or burlapping.

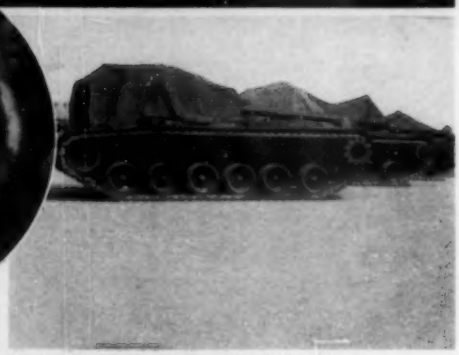
4. "Grade Checker" enables quick check on grade and helps get machine in adjustment during first few feet of travel.



Durable and Low-Cost Roads via LIME STABILIZATION

Engineers examining 8-year-old lime stabilized clay-gravel base at Fort Polk, La. 3% hydrated lime was used.

This hard concrete-like mass was removed from the lime stabilized base.



45-ton tanks and heavy wheeled vehicles are operated on 550,000 sq. yds. of roads and parking areas.

A typical example of how lime imparts strength and durability to clayey soils—the "bad actors" in highway construction—is Fort Polk, La., where 550,000 sq. yds. of lime stabilized base have been built since 1951, using in-place high P.I. gravel.

WHY DURABILITY? Lime increases CBR values 10 to 20-fold and unconfined compressive strengths 20 to 40-fold as a result of a cementing action between lime and clay particles. This leads to long-lasting roads, requiring little or no maintenance, as evidenced by actual roads now 12-14 years old.

WHY LOW COST? Generally, "in-place" clayey soils can be upgraded into suitable base or subbase materials, thereby eliminating expensive haulage, whether on new roads or reconstructed worn-out roads. Savings in base and/or pavement thickness are also possible through this added stability. Lime also expedites construction during wet weather.

Costs have averaged only 35-40¢/sq. yd. for 6 inches of compacted depth (complete except for wearing surface).

Lime stabilization is no longer experimental—over 2,500 miles of road attest to its permanence and economy . . . used successfully on all types of roads ranging from farm-to-market to interstate freeways, and including parking areas and airport runways.

RS

Write for FREE booklet "Lime Stabilization of Roads"

Write for information concerning a recently completed 23-minute, 16mm., color-sound movie, "Lime Stabilization of Roads," which is available for loan to any responsible highway and engineering organization.

NATIONAL LIME ASSOCIATION
925 15th STREET, N.W. WASHINGTON 5, D. C.

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How Contractor Snyder reduced traffic hazards for 3 major highways

moved 177,000 yds. of earth and rock in 250 days

Along the Tygart River, between Norton and Elkins, West Virginia, heavily-traveled U.S. Interstate highways 250, 33, and State highway 4 are combined into one, 8-mi., 2-lane road. To help traffic flow more smoothly and safely on this busy stretch, Bennie Snyder Construction Co. of White Sulphur Springs contracted to straighten and resurface 2.35 mi. of highway in 250 working days. The project required moving 177,000 yds. of material — 30,000 yds. of which was rock.

Snyder figured that to stay on schedule, and for lowest-cost earthmoving, he needed good haul-roads for his big-capacity trucks and scrapers. So he assigned his LeTourneau-Westinghouse Adams* 550 grader to maintain the 2-mi. haul-road and to smooth the busy highway detour in order to keep traffic flowing freely.

Handles jobs at fastest, most efficient rate

With its 15 speeds — 8 forward, 4 reverse, and 3 extra-slow creepers (optional) — Snyder's "550" handled these jobs at the fastest, most efficient rate. Haul-roads were kept smooth, level, and well drained. Result? Faster, safer hauler speed . . . increased production.

Good haul-roads also prolong equipment life . . . lower servicing, repair costs, and downtime. What's more, operators work faster, steadier . . . more productively . . . more comfortably . . . when traveling over smooth, well-bladed roads. The heavy-duty Adams 550 also cut bankslopes and ditches, built shoulders, and handled scattered service work needed for a tidy, profitable job and good public relations.

"Satisfied with performance"

Says Superintendent Herman Riggleman, "I like the '550' and its creeper gears . . . it does good work. We've always had Adams on our jobs — we're satisfied with their performance."

Increase hauler speed by up to 50%

With a modern Adams grader maintaining haul-roads a few hours a day, you can increase hauler speed by as much as 50%. You'll find too, that on *any* grader job, a fast, powerful LeTourneau-Westinghouse-built grader will push bigger, heavier loads . . . make deeper cuts faster . . . finish grade more accurately than competitive graders of comparable weight and horsepower. 7 models, 60 to 190 hp. Choice of GM or Cummins engines on 6 larger models. 190 and 135 hp models have torque-converter drive. Ask for a demonstration.

Snyder Construction's Adams 550 smooths haul-road near Elkins, West Virginia. Says operator A. D. Tacy, "I like this grader better than any I have ever operated. It has good blade visibility and steers very easy. I can cut any slope with this grader . . . the engine is a real power-house."

Grader pulls to side of narrow road, along Tygart River, to permit detour traffic to pass through job. Note smooth, hard condition of roadway — maintained by "550" — which lets both autos and production haulers keep moving without delay.

*Trademark G-1709-DCJ-1

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LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Job Safety

Safety-Conscious Job Supervisors

(Editorial in "Hendrickson News," employe publication of Hendrickson Bros., Inc., contractors, Valley Stream, N. Y.)

The strenuous effort directed toward safe practices in construction work consists of keeping supervision safety-conscious.

It would be impossible to estimate the number of times this same thing has been said or in how many different ways.

It is an indisputable fact that each foreman prizes a no-accident record. It is equally certain that the occurrence of an accident not only makes him unhappy but it fills him with the determination that a similar accident shall not take place.

Yet, come another day, something close to it may happen again but to another man. That is the time to take stock. A determination had been made not to suffer again the humiliation of such an accident. But what was actually done about it?

Did the foreman impress the first injured man with the error of his ways? Did he cause the hazard actually to be removed or corrected? Did he hold up the affair as a horrible example or object lesson to the other men?

It can be assumed that with the best of intentions, he still failed along one line or the other, resulting in repetition. The most important task facing the foreman on that day is to appraise the circumstances and come up with a solution.

It can be extremely simple. Take one of the most prevalent injuries, that of nail punctures. If the foreman promoted the 100 percent wearing of safety shoes and caused protruding nails in lumber to be stepped down instead of upon, he would not have to fill out any accident reports on that score.

It might be well to throw out a reminder at this point that Hendrickson Bros. provide safety shoes for their employees at less than cost and that there has been a falling off of orders in the height of the working season. 'Nuff said?

What has been brought up with regard to the repeating of certain types of injuries is equally true about seemingly unpredictable accidents. The foreman knows what work his crew is about to perform and it is his business to foresee unfortunate occurrences.

In many ways he must think for his men. Trained though they may be, nevertheless the foreman must not only control what they do but how they do it. That is his job and he must always stay on his toes safety-wise. This is by no means a new thought but it deserves some serious reconsideration.

Safety Engineer Employment

Safety engineers looking for jobs, and contractors looking for safety engineers, can turn to the National Safety Council's construction section. A special subcommittee, will keep a file on contractors about to start jobs, needing safety engineers, and safety engineers nearing the end of a job, searching for another.

To be placed on file, write the subcommittee chairman, Frederick H. Deeg, 20 N. Wacker Drive, Chicago 6, or Clement J. Luepke, staff representative, NSC Construction Section, 425 N. Michigan Ave., Chicago 11, Ill.

BUILT TO LAST

It's The Depth That Counts!

Deeper retreads mean longer service under rugged conditions, and Southern Tire retreads are as much as 1/4 inch deeper than ordinary retreads. Lugs of all Southern Tire retreads have as much rubber as a new tire and more undertread than any rock service tire. Southern's modern 3-section, interchangeable-tread molds retread any tire—regardless of growth—without buffing to the breaker strips. Careful, expert workmanship, world's most modern equipment plus finest quality rubber manufactured to Southern Tire's own specifications guarantee *new tire mileage at approximately half the cost.*

No Costly Downtime

Southern Tire representatives pick up and deliver your tires AT YOUR JOB SITE . . . AFTER WORKING HOURS.

All Sizes — from 1100 x 24 to 33.5 x 33
Tread designs to suit every job.

Always Deal With an Independent — Developers of Every Major Improvement in The Industry.

SOUTHERN TIRE COMPANY
1414 Broadway
SHEFFIELD, ALA.
Phone Collect
EV 3-2312

. . . for more details circle 306 on enclosed return postal card

How D. W. Winkelman
HANDLED "TOUGH ONE"
on Richmond-Petersburg Turnpike

Restricted, hilly work areas were no problem when 210 hp C Tournapulls helped build new Richmond-Petersburg Turnpike in Virginia. On cycles that included steep climbs, restricted areas, fast-moving "C's" completed 1.8-mile trips in 11.2 minutes. Contractor D. W. Winkelman Co. used 6 of its C 'Pulls, a "D", and a Tournatractor.

Virginia's Richmond-Petersburg Turnpike, only 34.7 miles long, presents just about every highway construction problem known. Half its mileage and 8 of its 17 interchanges are in crowded city areas. It involves 95 crossings and 19 structures, including a 4,220′-long bridge. And before the road is opened, 250,000′ of pipe will have been laid, 300,000′ of concrete piles driven, and 11,000,000 cu. yds. of earth moved.

Travel to job at 20 mph average

Handling one of the 17 separate R-P Turnpike contracts is nationally-known D. W. Winkelman Co., working through its Carolina Company. The firm is building a .9-mi. section of the 4-lane highway, near the center of Richmond. To move the 722,000 cu. yds. of earth involved, Winkelman used 6 of its C Tournapulls®, a D 'Pull*, Tournatractor®, 2 sheepsfoot rollers, 2 competitive scrapers, and 2 crawler tractors. The Tournapulls were driven to the job site from Greensboro, N.C., headquarters of the company, traveling the 200 miles in just 10 hours.

Like most contracts on the Turnpike, this one was tough. The general area through which the road passes is extremely hilly, with grades varying as much as 80 feet in 500. To make matters worse, the right-of-way is hemmed in by railroad tracks, major public buildings, and other "immovable" obstacles, limiting the areas that could be used as haul routes. Net result was that on some sections of the work, the haul roads were so steep that loaded scrapers had to be pushed uphill.

1.8-mile cycles in 11.2 minutes

Despite these difficulties, Winkelman's machines racked up excellent cycle times. One team of scrapers, assigned to the 60′ cut and 60′ fill work on the highway itself, averaged a 1.8-mile long-haul-spread trip every 11.2 minutes. Team #2, cutting under viaduct trusses at one end of the job (so the next contractor could come to grade) averaged an .8-mile trip every 9.1 min. The ruggedly-built Tournapulls took this work in stride throughout weeks of tough, uphill work.

High production, low upkeep

On rugged assignments like this Turnpike, Tournapulls keep production high, maintenance low. 210 hp, driving wide, low-pressure tires through a completely non-friction power train, licks tough hills, other difficult conditions. And their low, wide Fullpak® bowls speed loading.

Electric controls cut costs, boost production. Simplest of all power systems to maintain, Tournapull's "electrics" control bowl action, tailgate motion, apron lift, and steer.

Before *your* next "tough one", look into the LeTourneau-Westinghouse line of fast, rubber-tired earthmoving equipment. Your nearby distributor will be happy to give you all the facts and figures.

Low, wide Fullpak scraper bowl on Tournapull scoops up big payloads fast. Note straight-line action from pusher to cutting blade.

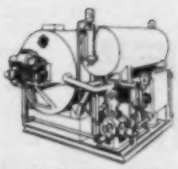
*Trademark CP-1711-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

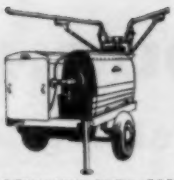
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

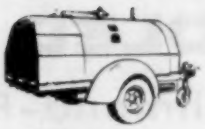
. . . for more details circle 398 on enclosed return postal card



HI-HEAT OIL HEATER



BITUMINOUS CIRCULATOR



STEAM GENERATOR

BOUGHT FIRST BROS ASPHALT UNIT IN 1952
BITUMINOUS MATERIALS & SUPPLY CO. NOW OWNS 14

Like success stories? Here's one, or actually two — one for the company and another for BROS equipment.

Bituminous Materials & Supply Company has been steadily increasing plant capacity since 1952 to meet the demands of the growing farm-to-market road surfacing program in Iowa.

Starting with one BROS Circulator, the company now owns 8 of these units, 3 BROS Steam Generators and 3 BROS Hi-Heat Oil Heaters . . . operating at its Davenport, Algona, Spencer and LeMars plants.

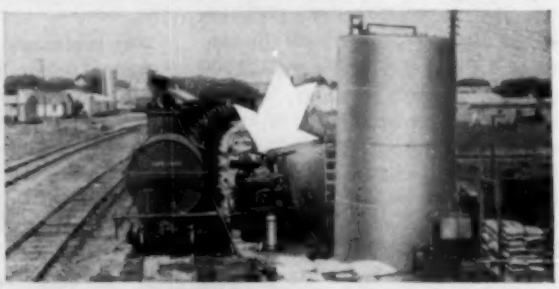
Day in and day out dependability through the years—that's the underlying reason why Mr. Claude Ruark, company's general superintendent, relies on BROS bituminous heating and handling equipment. There's no room for downtime during the busy construction season when the plants operate on a 'round-the-clock basis.

Take the Algona plant where 100,000 gals. of Emulsion, MC-1 and 120 tons AC asphalt materials are processed daily:

Raising material temperatures in the two 25,000 gal. storage tanks from 150° F to 300° F is accomplished by this BROS HO-20 Hi-Heat Oil Heater. It circulates hot mineral oil (commercial grade) through 430 ft. of 2 in. coils in the tanks. Fired by city gas, heating cost averages 50 cents per hour on a 24-hour work schedule.

BROS Oil Heaters of all sizes operate at below 15 psi; have fully automatic heating and safety controls and offer a wide range of BTU output.

From April to early June, this BROS Circulator has unloaded over 260 tank cars of bitumens at the Algona plant. In operation since 1954, it provides straight-line transfer from tank car to storage tanks because its special transfer pump moves materials at about 20° F



above semi-solid viscosity. Exclusive BROS "Tar Kettle" design surrounds and heats sluggish bitumens from both inner and outer firing chamber surfaces, uniformly distributing the heat and increasing temperatures fast — vital when high temperatures are needed.

Materials in some of the incoming cars are hard to "crack" and that's when the BROS Steam Generator goes to work . . . providing hot, dry steam in 20 minutes from a cold start. Over 76 years of heat transfer experience dictates the 2-pass design behind this speed record. Available are 15, 30, 52 and 60 HP models.

Your nearest BROS dealer will fill you in on all the details. Or write us for recommendations on your plant expansion plans.

BROS *Incorporated*

ROAD MACHINERY DIVISION

1057 TENTH AVE. S.E.
MINNEAPOLIS 14, MINN.

Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!

SHEEPSFOOT TAMPERS

ROLL-O-PACTOR

30-TON SELF-PROPELLED ROLLER

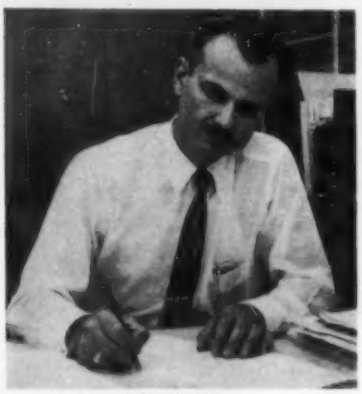
VIBRA-PACTOR

9-TON SELF-PROPELLED ROLLER

9 AND 13-TON ROLLERS

. . . for more details circle 249 on enclosed return postal card

EARTHWORK OFFICE METHODS WITH A SMALL ELECTRONIC COMPUTER



The Author

By Ben W. Steele

Assistant Engineer in Charge of Electronic Computing Systems, Oklahoma State Highway Department

Step-by-step review of new office procedures which are helping a highway department staff handle a doubled work load, with an accuracy heretofore considered impossible.

A SMALL-SIZE ELECTRONIC COMPUTER is making it possible for the Oklahoma state highway department to complete current earthwork computations in *one-twelfth* the time they used to take, with a degree of accuracy never before possible. The same relatively inexpensive equipment has also speeded a variety of figure-work functions ranging from checking contractors' bids through small-structure computations. The result is a step-up in our ability to handle time-consuming calculations at a time when this function has taken on increased importance.

Punched-card computers, such as the one we use, were originally introduced to expedite administrative data-processing, and in many instances their potential as engineering tools was overlooked. However, the electronic computer is bound to play a significant role in reducing the masses of figure work which highway construction will require in the very near future. Unless some method is found to streamline the complex calculations which form a natural workload in any highway department today, progress is bound to be slow.

Oklahoma is little different from most other states in this respect. We have eight scattered division offices, each with a division engineer and a construction crew. All major planning and figure work are handled at headquarters, where 300 persons are employed.

In 1957, we planned construction of between 700 and 800 miles of highway. For 1958, the dollar value of highways planned was doubled. This doubling of the dollar value did not mean the mileage was doubled, for roads being built under the federal highway program are more expensive to construct, but it does indicate a step-up in activity.

● **Right and left rodreading cards are punched for each station, using information from the level books. The books then go to the design department where design information is added. When the books come back to the operator, this new information is punched into grade cards.**

• These cards and others are put through the Remington Rand Univac 120 Punched-Card Electronic Computer which reads the information punched into them, computes and punched the results into the cards.

Most engineers, and technicians in general, are familiar with the shortcomings of traditional methods for developing earthwork figures. The desk-top calculators which are still useful for many other functions tie up valuable personnel, require extensive cross-checking to insure accuracy, and are far too slow to meet modern requirements. This lack of speed, of course, goes beyond the matter of extending the time between design planning and the start of actual construction. Involved also is money, for engineering time devoted to repetitive calculations is far too expensive to be justifiable.

We still begin development of earthwork figures as we used to, with engineers on the job taking rodreadings and entering them in the level books. At headquarters they go to the Remington Rand punched-card section, where those plus stations not necessary for earthwork computations are marked out. Left and right rodreading cards are punched for each full station, and for any plus stations not marked out.

• Programs of the Univac 120 can be changed quickly and accurately by inserting pre-wired connection panels.

These cards are set aside until the design department completes grade and section planning, which data are added to the level books. From these design facts, grade cards are punched for each station.

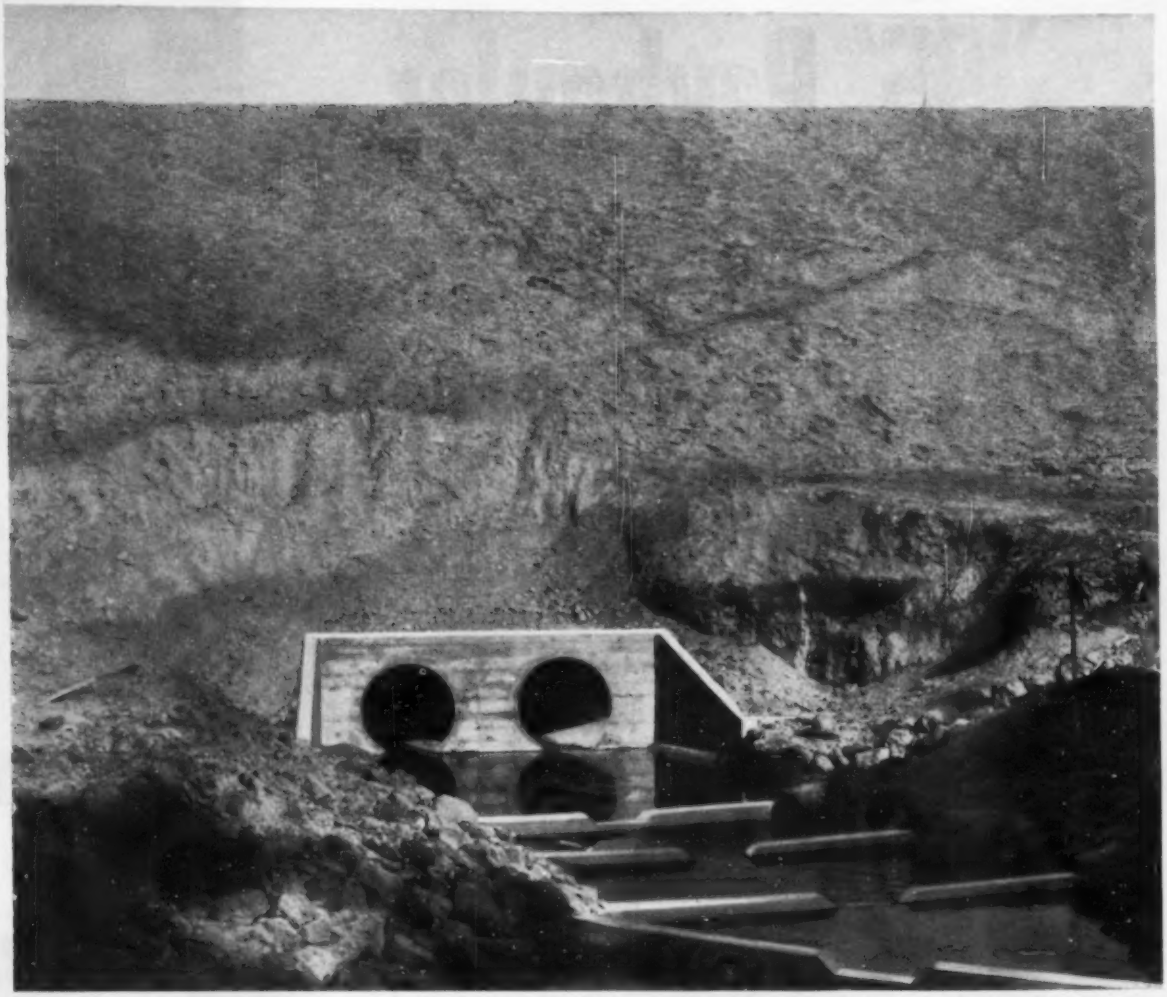
At this point the Univac 120 Punched-Card Electronic Computer makes the first of a variety of calculations in this operation. In one pass of the cards it compensates for any alignment equations, and punches in the super rate in feet per foot, the amount of widening, and the corrected grade elevation at each station. The cards are then arranged on the Electronic Sorter so that each grade card is followed by the right rodreading card, the left rodreading card, and a blank card in that order.

This combined deck goes through the computer twice. The first time, it interpolates rodreadings for the break at the shoulder beginning and end of ditch on natural ground. The second time it computes the area out to this shoulder break—

Two blank slope cards are merged behind the rodreadings cards on the Collating Reproducing Punch. On another pass through the Univac, the template rodreading computed for the breaking point of the shoulder is punched into the slope card. Up to this point we had been using a center rodreading, which is too high or low if there is any super. The rest of the ditch rodreadings are also punched in order of their distance out, including the interpolated rodreading for beginning and end of ditch.

On emerging from the computer, the grade cards and original rodreading cards are automatically sorted from the deck. The remaining three cards for each station—area card, right and left slope cards—are fed in again for computation of the right and left fill area in square feet, which is punched into the area card. The Univac automatically checks its own slope calculations, and corrects the slope if the one it was using carries the fill out past predetermined point, governed by the amount of fill.

(Continued on page 99)



Contractors: J. J. Welcome & Sons Construction Company, Redmond, Washington

Double-barreled culvert on Washington's U.S. 101...

they chose concrete pipe for maximum strength under 30′ overburden

Built to Washington State Highway Department specifications, twin lines of 48″ extra-strength reinforced concrete pipe carry the heavy load of the high fill. And resistance of the concrete to the overburden will *increase*. Concrete is the one material that actually continues to *gain* strength year by year.

Moderate in cost, concrete is always readily available to save you time and dollars. On this Washington job, the concrete pipe was produced in Olympia just ten miles away.

And for long-term economy—nothing else lasts like concrete. There's high resistance to abrasive wear. Concrete can't rust. And smooth pipe walls assure maximum flow.

Today, engineers everywhere are solving their difficult pipe problems with concrete—for pipe lines of all kinds.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

... for more details circle 298 on enclosed return postal card

"95" Payhauler® fleet delivers 98.5% availability

highballing rock loads over High Sierra grades

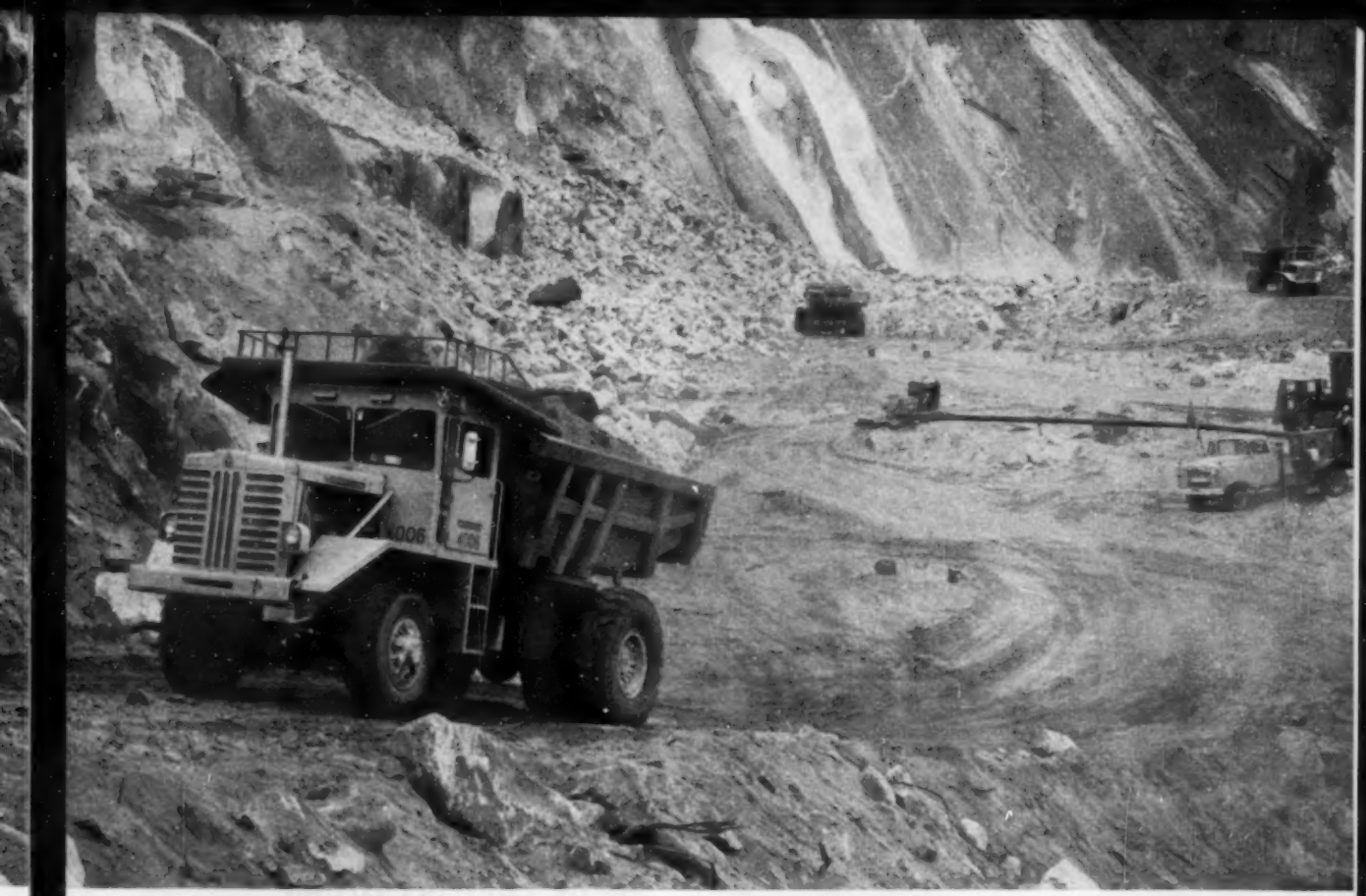
FOR SOUTHERN CALIFORNIA EDISON CO., LOS ANGELES

Mammoth Pool Hydroelectric Project, of Southern California Edison Co., is on the upper San Joaquin river—deep in rock-ribbed, steep-pitched High Sierra country.

It's a job where heavy rock-moving equipment soon reveals what's in it—and behind it—matching power, strength, and positive control against mountain grades, rough haul roads, and high-altitude operation.

Through one measured 12-week period, the 10-unit International Payhauler fleet on this project delivered an amazing 98.5% work availability. Payhaulers are built, throughout, to meet slam-bang, off-road conditions!

For each ton of carrying capacity, a "95" Payhauler has 277 lbs. of main frame steel to give unmatched "backbone" strength. Payhauler semi-elliptic, free-float-



"95" Payhaulers are "horsing" their 24-ton rock loads up grades as steep as 18%—on the Mammoth Pool Project! The "95's" Turbo-charged diesel engine develops 335 hp—the 18-ton "65's" is 250 hp!

Here's part of the 10-unit "95" Payhauler fleet parked during noon-hour, that established the amazing 98.5% availability record on Southern California Edison's Mammoth Pool Project!

ing springs gain extra shock-swallowing support from extra leaves and extra length. Payhauler speeds match every load and road. And Payhauler exclusive integrally-forged full-floating planetary drive axles take full-torque loads without over-stress.

This extra built-in stamina helps International Payhaulers establish standout availability records. And so does ready availability of parts and service from your International Construction Equipment Distributor's well-stocked bin and well-manned shop—backed by factory warehouse parts reserves.

See how a Payhauler's bonus of Turbo-Charged diesel power assures you fuel-thrifty, big-load performance—even at high altitudes. Watch how power on Payhauler rear wheels helps deliver top operating efficiency on steep grades or mucky conditions—even where trailer-type units "spin their wheels." Prove that Torqmatic braking safely and positively controls the fully-loaded "95" downgrade—with little or no foot-brake help! See your International Construction Equipment Distributor for a demonstration!

. . . for more details circle 282 on enclosed return postal card

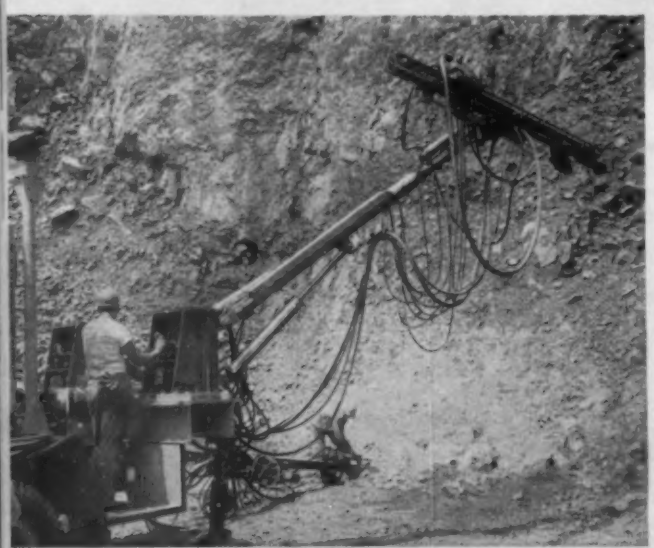
Two rock-loaded "95's" are on their way—while a third one spots its big-target body for the shovel. Five International Planet-Power steered TD-24's and 12 UD-6 International power units on generators also help make this $50 million job roll!

International® *Construction Equipment*

International Harvester Co., 180 North Michigan Avenue

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

GYRO-FLO *in the new*



▲ High holes, horizontal or at any angle, are no problem at all with this truck-mounted drilling rig. Operator at the control station can "spot" the drill anywhere he wants at the touch of a throttle.

▼ Photo below shows that toe holes are "duck soup" for this Gyro-Flo 900 and Hydra-Boom combination.

Truck-Mounted Drilling Rig Helps Contract Driller Meet Deadline Dates

"Take a highway truck chassis, add a 900-cfm Gyro-Flo compressor and two I-R Hydra-Boom units equipped with two D45, 4½" Bore drifter drills, and you're in business with the fastest contract-drilling unit you ever saw." So says an official of the New Jersey Drilling Co., who admits that this is a slight oversimplification. "Some planning and good design went into this rig, too. The I-R distributor and sales engineer sure did a fine job on this rig."

The truck-mounted drilling rig shown here has lived up to his every expectation—helped him finish up faster and meet the tightest deadlines with a minimum of man-hours and drilling expense.

GYRO-FLO 900 PROVIDES AMPLE AIR POWER

A standard 900-cfm Gyro-Flo rotary portable compressor, less running gear, was mounted on a 6-wheel highway truck chassis. There was plenty of room available to mount two Hydra-Boom drills. The completely self-contained compressor provides ample air power for any job—will run both heavy-duty drills simultaneously at full pressure. The rig can move from job to job at a moment's notice and at maximum highway speeds. A frame above the compressor holds the drill towers while in transit.

HYDRA-BOOMS CONVERT SETUP TIME TO DRILLING TIME

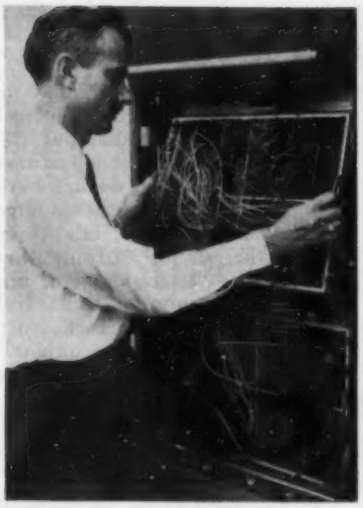
With two heavy-duty I-R D45 rock drills mounted on Hydra-Booms, the New Jersey Drilling Co. can set up to drill any type of hole patterns in a matter of minutes. All drill-tower motions, including power dump and swing and power cone, are controlled by the touch of a throttle. Husky hydraulic cylinders, five for each drill, have completely replaced the time-consuming muscle power formerly required to set up for each hole.

Ask your Ingersoll-Rand representative to show you how Gyro-Flo compressors and I-R rock drills can help speed *your* drilling work, with important savings in cost per foot of hole.

Ingersoll-Rand

2-835 11 Broadway, New York 4, N. Y.

AN UNBEATABLE COMBINATION . . . GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS



● When a new program panel is needed, it is wired, then checked step-by-step with this dial on the test panel.

● A wavy line of dots, printed on the tabulator indicates visually the amount of dirt being handled, cut or fill, station by station, for the proposed highway.

● Supervisor of Punched Card Accounting, feeds cards through a Remington Rand Collating Reproducing Punch, readying them for a Univac run.

(Continued from page 94)

During this same pass, the computer also punches into the area cards the following information for slope fills:

Distance from center line to cross-over point (where slope fill hits natural ground):

Elevation of cross-over point, and rate of slope used.

On the next pass, slope cut information is developed—the slope cut area, cross-over distance, and elevation. The slope cards are sorted out; we are finished with them. The area cards are collated with blank mass ordinate cards, and simultaneously the Collator punches into these mass ordinate cards the station number, rock swell and compaction factor, right and left cross-over data, slope rates—all the facts from the area cards except the area information itself.

The computer then uses the center area and slope area to calculate the total area to the nearest tenth of a foot. It computes the true volume, both cut and fill, to the nearest cubic yard, and the adjusted volume, cut and fill, to the nearest cubic yard. Univac also figures the mass ordinate for each station—in cubic yards—from which is determined whether there will be an excess of dirt, or dirt will be needed, and if so how much. On this single pass the Univac punches all this data into the mass ordinate cards, and automatically sorts out the area cards.

A list of the mass ordinate cards and grade cards is printed on separate forms by the Tabulator. All plus stations are now sorted out of the mass ordinate deck, and from the full stations left, a new deck is reproduced bearing only the station number and the ordinate. This new deck will become the "Mass Diagram" deck. Through a series of machine operations, these cards are sorted, the computed ordinate is evaluated, and a control punch is placed in each card in a position relative to each ordinate value. From these cards a "Mass Diagram" or "Earthwork Graph" is plotted on the Tabulator. This chart, simple to produce, provides us with quick, visual information on how the earthwork would go on the project as it is planned. The position of bridges can also be shown by including a card which causes the Tabulator to skip as many stations (spaces) as the bridge is long.

Thus the bulk of the figurework for the project is complete. The mass-diagram, plus the printed forms representing mass ordinate and grade cards, go to the design department which planned the road for re-evaluation from an economic standpoint. Design department personnel and the field engineer generally take this information on the job together. They make necessary spot changes right on the plan and profile sheets. Changed sections are then re-run on the computer.

● What this recital means in terms of operation of this department can be seen in the fact that in less than four hours, we have the earthwork calculations needed for a mile of highway. This includes about three hours of operator time to punch and verify cards at the beginning of the operation. Univac time, including time utilized on the other equipment which comprises most of it, is some 45 minutes. Comparing this with the best results obtainable through previous methods, we estimate that we are now producing figurework 12 times faster than we could before.

It is well to note that the Univac is self-checking, and operates with assured accuracy. It proves its work as it goes along, so that there is no need to perform calculations twice.

Other applications we have put on the equipment include checking contractors' bids for accuracy, and determining the low bidder, second lowest, etc.

● The computer is used to calculate the exact shape and area of each portion of an easement, telling us how much of the easement is in each section and how much belongs to the present owner. Using conventional methods, an engineer can figure four such easement problems in an eight-hour day; the Univac does four of them in five minutes. The time required to obtain right of way information from the plans is relatively short: however, as yet many curved conditions exist that we do not have programmed.

Also handled electronically are such functions as cost analysis on all state equipment; maintenance costs on state road; small structure computations, amount of steel or concrete necessary for a culvert, calculating how much water runs off a given area with a given slope.

There is very little to be done about the extent and complexity of computation required in highway construction, but the smaller computer, far less expensive to operate than its larger brothers, is providing an excellent solution.

Seven Consultant Firms Form Computer Service

What can the small engineer do about his computer requirements?

He needs the computer but (1) he can't afford even the lowest cost machine and (2) he doesn't have enough work to keep the computer busy by himself. He might try some of the established computing centers, but this could prove unsatisfactory because of the travel time involved and the inefficiency of results because of the unfamiliarity of the computer center people with the problems presented.

One answer to the small engineer's problem: form a computing center conveniently located, on a cooperative basis. Seven consulting engineering firms in downstate Illinois have done that, forming the Midwest Computer Service, Inc.

Major assets of this unique corporation are a Bendix G-15D leased from the Computer division of Bendix Aviation Corporation; an office located in Decatur and a staff including a programmer; an operator, and a secretary. The seven participating firms are located within 100 miles of Decatur.

L. R. Schureman of Washington, D.C., chief, electronics branch, division of development, Bureau of Public Roads, said he believes this is the first such venture.

E. M. Chastain, partner of Homer L. Chastain and Associates, Decatur, and president of Midwest Computer Service, Inc., explained how the corporation came to be formed: "For the smaller engineer, the situation has reached the point where it's a matter of get a computer or get out of the race. We saw we needed a computer but we didn't have enough work to justify full-time use of one. We then got the idea of forming a corporation with other nearby firms as participating members."

In addition to the Chastain firm, the others are: Crawford, Murphy & Tilly, and Jenkins, Merchant & Nankivil, Springfield; Rochester & Goodell Engineers, Inc., Salem; Hurst-Rosche, Inc., Hillsboro; Clark, Daily & Dietz, Urbana; and Warren & Van Praag, Inc., Decatur.

Each agreed to purchase enough time on the machine to assure the first year's budget. Services of the Decatur center are expected to be made available later to nearby industry Chastain said, and he reported inquiries already have been received from utilities and manufacturing and processing plants.

"Cuts maintenance to the bone"

PACKAGED SIGNS
SPEED INSTALLATION

To the natural advantage of light weight, Tassco provides these aluminum signs in pre-arranged packages ready for installation. The easy-to-handle panels are assembled on the job site and mounted in a matter of minutes.

TASSCO

This is North Carolina's new Route 85, by-passing cities, moving traffic quickly with the help of a signing program by Tassco. The complete program consists of ground mounted and overhead signs. The signs themselves are increment sheet signs developed by Tassco especially for use on modern, high-speed roads. They can be had in any height or width and are designed to meet 100 mph wind loads. The use of increment sheets means new lows in the cost of both materials and installation. But what is most important, since the State has to bear the costs of maintenance, is that with 1193 signs, 501 sign supports, and with 9 large sign spans, not one drop of paint is required for maintenance.

North Carolina's signs feature the approved reflectorized green background with white AGA letters. However, reflective material or painted backgrounds are available in any type letters or symbols.

Helpful data, including a full color movie, is available from the Tassco-P & K Highway Planning Committee. Write for "Committee Data" today.

TRAFFIC AND STREET SIGN COMPANY
84 FOUNDRY STREET, NEWARK, N.J.

. . . for more details circle 323 on enclosed return postal card

● Helping Syracuse dig out, equipment leased from contractor S. J. Groves & Sons Co., Inc. Most cities found their maintenance fleets completely inadequate, with upstate counties and towns also in need of emergency help.

Contractors Played Blizzard Role

Rented bulldozers, loaders and graders and their operators shared with state, county and city maintenance crews the credit for opening up after the recent record snowstorms in the Middlewest and Northeast—with praise also due military agencies.

THE RECORD SNOWSTORMS of the past winter will long be remembered for the way contractors came to the rescue by renting out their equipment. It took heavy tractors, tractor shovels and motor graders—and their experienced operators—to open up many streets and highways.

The 40 to 50-in. fall in Michigan City, Indiana, was a localized freak storm caused by cold air passing over Lake Michigan. Record blizzards also belted New York State and the New England area.

The amount of heavy equipment maintained by governmental units for snow removal has steadily grown smaller. Army and Air Force equipment, including helicopters, were available for emergencies, but even those couldn't fill the gap. And the whirly-birds couldn't cut down 30-ft. drifts and clear the roads.

That's where the contractors took over to help out the maintenance crews.

New York state was among the hardest hit areas. Governor Averill Harriman declared a state-wide emergency February 21. The storm was the state's worst in more than 40 years. In Albany county, civil defense director Col. Alfred H. Jacobsen appealed for privately owned equipment; machines were brought from as far as Ohio.

Snow blowers, motor graders and bulldozers handled most of the big jobs. Jacobsen's call brought three Sno-Gos and four graders from Schenectady General Depot and four Cat D7s and two graders from Voorheesville General Depot, plus privately owned machines.

Highway crews in the town of Colonie, Albany county, worked mainly with rented dozers after the town's trucks broke down. They included two Allis-Chalmers dozers and a TD18.

The Civil Defense Director of New York's Schoharie county, E. A. Ligenfelter, said the county's "most urgent need now is for large crawler tractors equipped with V-plows and wing plows."

The Army put four Cat D7s and two Cat No. 12 motor graders into Schoharie county. County-owned tractors, a Cat No. 955 Traxcavator and motor grader owned by townships also worked in the county. But these were not enough, and privately owned machines had to be used.

(Continued on page 104)

● ***(Left):*** **A Caterpillar D6 crawler with 6A blade, owned by Schoharie county, New York, clears a road to get to a marooned dairy farm family.** ***(Right):*** **A No. 955 Traxcavator, owned by the town of Carlisle, New York, clears a township road. Drifts were 15 ft. deep.**

"USING FORD HEAVIES HAS MADE A BIG CUT IN OUR MAINTENANCE COSTS"

says Allen Grosse
Fleet Supervisor
Green Bay Box Company

Handling heavy loads with ease, this Ford C-1000 used by the Green Bay Paper and Pulp Company (an affiliate of the Green Bay Box Co.) grosses 60,000 lb. It is equipped with 260-hp 477-cu. in. Super Duty V-8, Extra Heavy Duty 5-Speed transmission and 6.50 to 1 rear axle ratio.

GO FORD-WARD for Savings, Style and Stamina!

Whatever your job . . . wherever you do it—you'll find Ford Heavies and Extra Heavies are engineered and built to do it better! And the '59 improvements in these models will bring still more benefits to your operation.

Greater operating economy with new, faster rear axle ratios and wide choice of transmissions.

More efficient parking brake of the internal expanding type has approximately 50% greater stopping and holding ability, requires less than half the operating effort needed for the previously used type.

Higher payloads and longer life with new, higher-capacity front and rear axle options.

Factory installed tractor package custom-fitted to Ford trucks for safer, more dependable braking.

Yes, the new '59 Ford trucks are here to take you *Ford*-ward for savings, *Ford*-ward for modern style and stamina. See your Ford Dealer today!

"Our records show that our average monthly parts cost, including major overhauls, has been reduced over 24%.

"Our Fords have given us less trouble than any other make of truck we've owned! Also, our Ford Dealer has always given us immediate and very good service. We've never had any downtime waiting for parts. They're always available at our Ford Dealer's, so we don't have the problem or expense of carrying a big parts inventory.

"Our drivers sure like the 'hillability' of the big Ford Tilts with their Super Duty V-8 engines! They say the 'Big V' has sure got it for power that seems to level out the steepest hills. And the Tilt Cabs are tops for maneuverability and riding ease.

"Performance plus economy . . . that's why we're sold on Ford trucks. We started using Fords when we opened our trucking department in 1954, and today 28 of our 35 trucks are Fords."

New Styleside pickups! Notice the handsome new grille, dual headlights, stronger wrap-around bumper. 6½-, 8- and 9-ft. boxes available in Styleside or Flareside models. Short Stroke Six or V-8 engines.

. . . for more details circle 268 on enclosed return postal card

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

CONTRACTOR'S BLIZZARD ROLE

(Continued from page 101)

The city of Syracuse, which owned only three graders, rented another 30 from contractors.

J. Thomas Cribbs, president of the Eastern Milk Producers cooperative, told Governor Harriman that New York-New Jersey dairy farmers had lost a million dollars because they were unable to deliver their milk.

Indiana Govenor Harold Handley also declared an emergency in his state, in the area around Michigan City. The blizzard was the area's worst in 20 years. More than 50 in. of snow were reported to have fallen in 24 hours.

Snow removal equipment was sent to the Michigan City area from Michigan, Illinois, Ohio and Wisconsin, as well as other parts of Indiana. The Fifth Army sent helicopters from as far as Fort Riley, Kansas. An Army tank retriever helped drag out buried gasoline trucks and get things started in Michigan City. Hylmar Keil, and Indiana district highway engineer, said the area's greatest need was for rotary blowers and V-plows.

Kirsch Construction Co., Hammond, Ind., rented six D6s and two tractor-shovels to Michigan City. Another contractor, Brown Inc., of Michigan City, worked a D6, two D8s and two DW21s in the area.

Contractor-Designed Blade Expedites Backfilling

A good workman with a good tool can be counted on to use that tool in solving any problem. This is true of Harry Backhus, a partner in the D. & B. Ditching Service, Leavenworth, Kansas.

Backhus rigged an old grader blade onto the bucket of a Sherman "C" power digger to speed backfilling. The firm has tackled what Backhus calls "over-sized jobs" with this unit. When the picture was taken Backhus had just returned from a trenching job where most of the digging was through sandstone.

New Workman's Compensation Rates in Pennsylvania

New Workmen's Compensation Rates for Pennsylvania became effective September 1, 1958, at which time existing insurance was adjusted. As reported in a bulletin to members of the Constructors Association of Western Pennsylvania, these rates have trended downward for most items, as tabulated.

New Home of Michigan Road Builder's Association

Here is the new office building of the Michigan Road Builder's Association, 611 W. Allegan St., Lansing, Michigan. It was dedicated in June with Governor Williams officiating. Also taking part in the ceremony were David R. Calhoun, president, Michigan Municipal League; John H. Barr, engineer-director, Michigan County Road Association; Col. P. Hyzer, district engineer, Corps of Engineers, Detroit; N. E. MacDougall, division engineer, Bureau of Public Roads; Howard E. Hill, deputy commissioner-engineering, Michigan State highway department.

New Office for Reynolds Metal

The new Reynolds Metals Company general office building, Richmond, Va., which contains 1,235,000 pounds of aluminum—a showcase of the light metal's many uses in modern architecture. Reynolds is a leading supplier in the growing field of aluminum products used in highway construction (light standards, traffic signs, bridge railing).

Classification	1936	1957	1958
601 Roads and Streets	7.00	2.60	2.45
603 Sewers	9.75	2.15	2.30
605 Railroads	7.00	2.00	2.00
607 Drilling	6.00	3.10	3.35
609 Excavation	5.50	1.80	1.85
611 Pile driving	9.00	2.40	2.15
615 Tunnels and shafts	12.00	4.95	4.00
653 Masonry	4.45	1.15	1.20
654 Concrete construction	7.50	1.50	1.55
655 Iron erection	15.00	4.35	4.20
713 Dredging	3.85	3.00	2.40

It has been the practice, notes the bulletin, for the legislature to increase the benefits paid under this compensation program each time they meet. Yet, the rates are being lowered a bit each year which is considered a tribute to the safety programs of the local Association and the AGC.

ENGINEERING CONSULTANTS. Directory of the American Institute of Consulting Engineers. This list of qualified engineers and companies, with biographical data, is available on request from the Institute at 33 W. 39th St., New York 18, New York. Price $2.50 clothbound, or $1.50 papercovered.

REO

No name in heavy hauling equipment merits more respect for reliable performance than Reo's rugged line of trucks. Every Reo is engineered to its specific job . . . custom built completely to it . . . and powered by the most advanced high-efficiency engines available—gas, LP-Gas and Diesel. This power is coupled to power train components of proven performance, assuring speed and agility under full loads. To reduce chassis weight, Reo's framework is engineered to provide the ultimate in strength with the lowest possible weight. **Additional allowable payload within legal limits is possible through Reo axle placement.** For information on Reo's complete tandem line, including special models for **transit mix, dump work** and **oil field service,** write for new model folder. REO DIVISION, The White Motor Company, Lansing, Michigan.

Gold Standard of Values

LACLEDE DESIGNED REINFORCEMENT SPEEDS REPLACEMENT OF CONCRETE BRIDGE DECK

A ticklish problem arose in the renovation of MacArthur Bridge, spanning the Mississippi River at St. Louis. Three existing pavement lanes were to be replaced with concrete slabs, reinforced with Laclede Multi-Rib Round Reinforcing Bars. To permit uninterrupted traffic flow over the bridge, the project was to be accomplished a lane at a time.

the problem:

Vibration from traffic on a completed lane would be transmitted through the tie-bars, disrupting bond of the reinforcement to newly-poured concrete in the adjoining lane.

the solution:

Laclede engineers, cooperating with the Bridge Department of the City of St. Louis and C. E. Smith & Company, consulting engineers, designed special tie-bars with three-inch-wide bands of asphaltic material wrapped around the point where they passed through the center joint. Vibration from heavy vehicular traffic was cushioned and absorbed by these flexible wrappings. Bond of reinforcement to new concrete in the lane under construction remained unaffected during the entire setting and curing period.

General Contractor: Fruin-Colnon Contracting Co., St. Louis.

LACLEDE®

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

. . . for more details circle 285 on enclosed return postal card

New Products

Reader Service Numbers on Enclosed Postcard
More products beginning on page 110

Dumping the "Transloader"

The "Gismo Transloader"

Designed originally as a mine mucker, the "Gismo" is now developed into a "Transloader" for more general uses in the quick handling of material from excavation to dump. It is described as "consisting basically of a large dipper with teeth, intermediate fold-back mechanism with adjoining and self-contained haulage body, and dump door. The dipper and fold-back action cascades material back into the "Gismo" until the dipper loads itself, and the entire machine becomes a transport with approximate 6-ton payload."

Among features stressed by the manufacturer are—transporting speeds up to 20 miles per hour in either direction—no jackknifing in mucking—no turning or positioning for loading—fingertip controls for dump doors and hydraulic winch activating mucking dipper—oscillating coupling between body and prime mover to permit operation over rough ground—no conventional steering mechanism.

Sanford-Day Iron Works, Inc., Knoxville, Tenn.

For more details circle 101 on Enclosed Return Postal Card.

New Cleveland Trenchers

At a 3-day meeting in September, The Cleveland Trencher Company unveiled four new machines to its distributors and the press—Models J-20, J-30, J-40, and JS-30. All have a new type, V-shaped discharge conveyor which is driven, shifted, and reversed in direction of discharge by an independent hydraulic drive controlled from the operator's seat.

The V-shape provides maximum clearance under the digging wheel rims, allows higher heaped loads without clogging, and the passage of larger stones. It also permits higher and farther spoil discharge and simplifies the addition of extensions to the conveyor for truck loading and other special spoil-handling requirements.

Cleveland Trencher Model J-20

The four machines have new-type non-packing crawlers, hydraulic steering brakes, complete automatic "push-button control" of the discharge conveyor, and many other new features. Their digging depth is 5½ ft. Principal uses are listed as follows:

J-20—Utilities, lines in urban areas (digging width 11-24 in.).

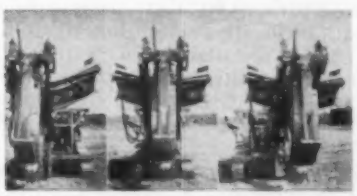
J-30—In open areas, where lower ground bearing pressure is required (digging width 11-24 in.)

J-40—In open areas, for larger diameter pipe (digging width 15-30 in.).

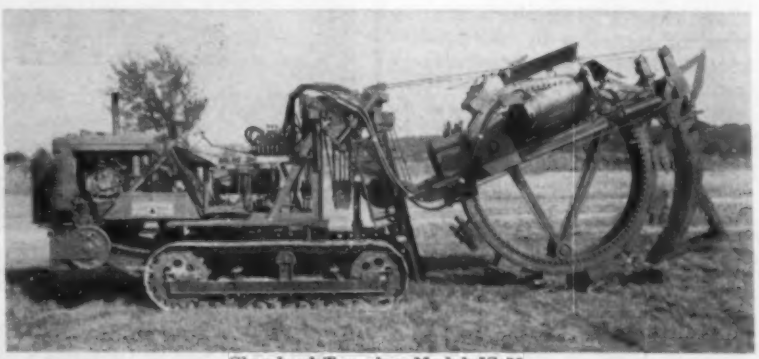
JS-30—Utilities and other special urban uses (digging width 11-24 in.).

Notable on the JS-30, in addition to other features, is a power-shifted, power-tilted digging wheel and a power-raised-and-lowered crumbing shoe. The wheel can be shifted laterally as much as 30 in. to either side of the center line of the trencher, permitting it to dig flush with outer edges of the crawler tracks or at any point between them. The power-tilt enables it to dig vertical-wall trench on side slopes or in conditions where one crawler track must be on a higher level than the other.

At the September meeting, the company also showed important new features on its Model 240 trencher and Model 190 backfiller. With the addition of the four new units the Cleveland Line will in-



End Views of the JS-30 showing digging wheel power-positioned to extreme left, to center, and to extreme right.



Cleveland Trencher Model JS-30

clude ten wheel-type trenchers and two sidecrane-backfillers.

The Cleveland Trencher Co., 20,100 St. Clair Ave., Cleveland 17, Ohio.

For more details circle 102 on Enclosed Return Postal Card.

Paves on Crawlers Travels on Rubber Tires

Model 873 asphalt finisher announced this month by Barber-Greene was designed primarily for paving driveways, parking lots, filling stations, drive-ins, and similar jobs, but is said to have been applied with equal success to highway shoulders, turnouts, accelleration and decelleration lanes, etc. Paving widths are from 6 to 12 ft in 3-inch increments.

Most distinctive mechanical feature is the combination of crawlers and retractable wheels to provide maximum stability and traction while working with fast transportation (30 mph) between jobs. Retraction is by hydraulic power; towing tongue is attachable in seconds.

It is stated that the 873 offers the same tamping, leveling and thickness control as does the company's larger Model 879-B finisher. Since the incidence of sub-grade irregularities is likely to be higher in the applications for which the 873 was specifically intended, ie, driveways, etc., the ability of the machine to compensate for these irregularities automatically is important. Its compaction simultaneous with strikeoff, places additional compacted material into low spots to maintain level under traffic and rolling. All mat thickness changes are gradual.

Hopper sides raised and tilted hydraulically permit flat angle for maximum capacity and clearance when receiving mix and a discharge without hand shoveling or clean-up. Directional control is by a single "joystick" which eliminates the need of operation by independent clutch levers, and provides a prompt, and accurate response in matching joints or following a directional line. A single deflector in the hopper directs material to either side as needed for bleeding out extra material or laying a super-elevation.

Barber-Greene Company, Aurora, Ill. In Canada — Barber-Greene Canada Ltd., Barber-Greene Road, Don Mills, Ontario, Canada.

For more details circle 103 on Enclosed Return Postal Card.

The Model 873 with Sides Tilted Up

Excavator and Carrier

Here shown is a "Samson" multi-purpose excavator manufactured by Avery Tractor, Inc., West Lebanon, N. Y., mounted on a Crane Carrier Corporation chassis custom built to the machine's exact needs. The excavator is fully hydraulic and full-swing to operate in the tightest positions. As here mounted, it functions as a fully mobile backhoe, shovel, crane, clamshell, grader, grapple, or magnet.

Crane Carrier Corporation, P. O. Box 5008, Tulsa, Oklahoma.

For more details circle 104 on Enclosed Return Postal Card.

Carrier-Mounted "Samson" Excavator

Bright Sign Without Glare

The new "Panelescent" lamp super-highway marking sign, here shown under test on the Roseville Freeway by the California Division of Highways, is said to offer much greater driver readability than conventional lighted signs and at one-half the power consumption. It marks the first use of a two-dimensional light source in a highway sign.

The letters of the sign are their own light source, with each letter composed of from one to three individual "Panelescent" lamps. These lamps are the Sylvania Electric Products device which produces light over the entire surface of a

(Continued on page 110)

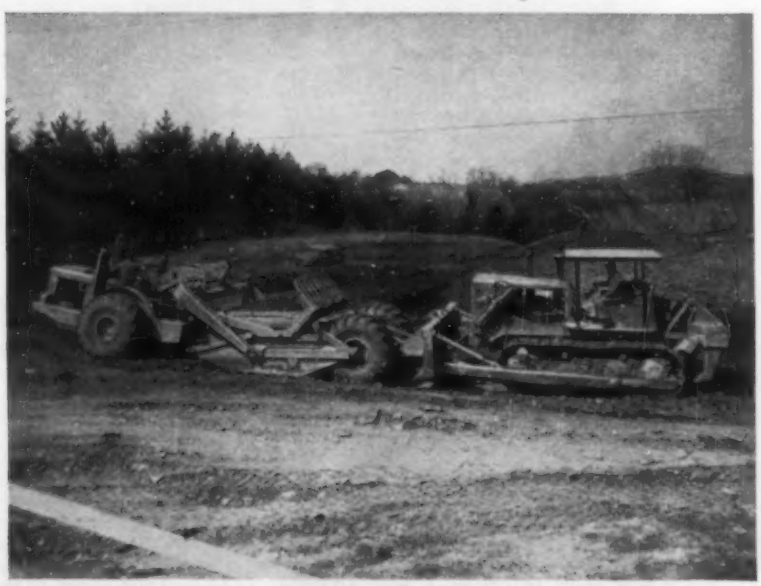
"Panelescent" Sign on California's Roseville Freeway. The bright beam of light across the night picture is from the head lights of passing automobiles.

He beat the schedule in spite of bad weather

with Allis-Chalmers Construction Machinery

In spite of the loss of 44 working days due to bad weather, the Bracken Construction Company finished the relocation of Route 861 near Bethlehem, Pennsylvania, well ahead of the 135 days allotted.

Dale Bracken
Bracken Construction Co.
Sligo, Pennsylvania



HD-21 quick-loads TS-260 motor scraper. With ripper, HD-21 weighs approximately 61,634 lb . . . delivers 225 net hp.

225,000-yd operation

This contract included the moving of 225,000 cu yd of dirt and shale. Bracken used a fleet of Allis-Chalmers machines on this operation—HD-21 and HD-16 tractor-dozers and TS-260 motor scrapers. The company also owns an HD-6G tractor shovel and a TR-260 rock wagon.

Job superintendent, Dale Bracken, says the powerful HD-21 tractor-dozer, equipped with a Tractomotive ripper, did an excellent job—loosening 24 in. of shale and rock at a pass. On tough jobs like this, the ability of the HD-21 torque converter tractor to automatically match power and speed to load lets it handle such large cuts.

Two of Bracken Company's HD-16 tractor-dozers shape a heavy fill up to 57 ft deep. A third HD-16 was used for push-loading in the borrows.

2,400-ft cycles

Speeding through a 2,400-ft cycle, each TS-260 with a struck capacity of 11 cu yd averaged 1,000 cu yd per shift. Bracken reports positive forced ejection and high apron lift saved time by dumping wet loads quickly and cleanly.

Preventive maintenance helps build high production

Mr. Bracken credits his company's ability to meet earth-moving schedules to the combination of modern construction machinery and a sound preventive maintenance program. Allis-Chalmers construction machinery will give *you* dependable performance like this, too. Your Allis-Chalmers dealer has machinery for every earth-moving job. He will demonstrate the machine of your choice on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

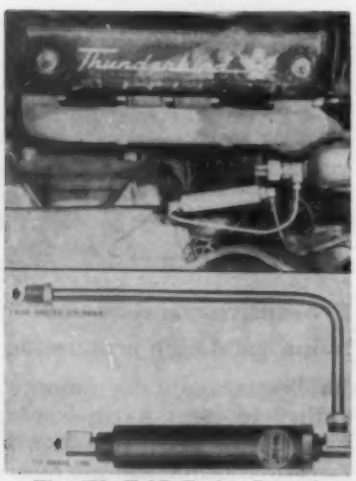
. . . for more details circle 242 on enclosed return postal card

More New Products

(Continued from page 108)
panel by the principle of electroluminescense—the creation of light through the excitation of certain phosphors placed in an electric field. Only 1/16 of an inch thick, the lamp produces a uniform light without the use of bulbs, tubes, filaments, cathodes, or heavy ballasting devices. The company's engineer at the test stated, "The soft diffusion of the Panelescent sign's letters makes such a sign glareless and provides the ultimate in contrast for high visual acuity at great distances," and added "The Panelescent lamps have extremely long life which makes possible marked economies of operation and maintenance."

Sylvania Lighting Products Division of Sylvania Electric Products, Inc., Salem, Mass.

For more details circle 105 on Enclosed Return Postal Card.



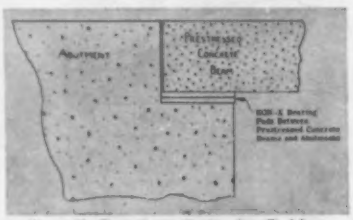
The "No-Vak" Brake Control

New Brake Control

Designed to greatly increase the operator's braking control, particularly at high speeds, a new product, the "No-Vak", is being marketed by Superweld Corporation for use on passenger autos and light trucks. Installed in the brake system between the master cylinder and the wheels, it equalizes pressure on all brakes simultaneously, and also functions as a booster unit, increasing brake action nearly 100%. "No-Vak" operates at pressures up to 2,000 psi. When subjected to excess pressures, or in case of any malfunctioning, back pressure unseats the ball check and allows the fluid from the master cylinder to bypass the "No-Vak" unit and flow directly to the wheels; thus, there is never any possibility of losing fluid pressure through the use of "No-Vak". The device comes in simple kit form and can be installed with ordinary hand tools.

Superweld Corporation, 6840 Vineland Ave., North Hollywood, Calif.

For more details circle 106 on Enclosed Return Postal Card.



Kon-X Bearing Pads in Bridge Construction

Bridge Bearing Pads

Savings in time and cost are claimed for "Kon-X" bearing pads, announced by Keasbey & Mattison Co. Made from asbestos fibers combined with synthetic rubber elastomer, these pads find greatest use in bridge construction where they are placed between prestressed concrete beams and bridge abutments and piers. Here, the pads, used in pairs, with their graphited surfaces in contact with each other are stated to effectively reduce friction and stress concentration caused by beam expansion and contraction. Unaffected by weather they can be used in a variety of climates.

Use is also seen for "Kon-X" as spacers between the concrete flooring of bridges and the metal bases which support the guard rails, assuring a permanent bearing and a tight, uniform joint. When used between steel decks and aluminum guard rail bases, "Kon-X" prevents electrolytic action caused by the impingement of aluminum on steel.

Keasbey & Mattison Co., Ambler, Pa.

For more details circle 107 on Enclosed Return Postal Card.

Loader and Dozer

A new 2-in-1 combination ⅝ yd loader and dozer in the low-price crawler class is now being offered by J. I. Case Co., Vertical connecting arms between loader and dozer serve as lift when operating the full-size blade. Switching to loader operation takes only 5 minutes and involves no change in the single, powerful hydraulic system that operates both tools.

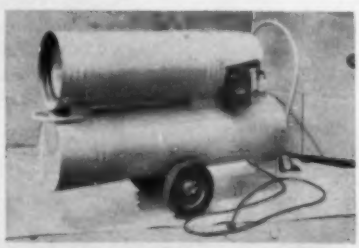
The new unit employs a basic Case

Case 42-HP "Utility" 310 Loader-Dozer with 84 in. x 25½ in. Angledozer Blade

Utility Model 310 crawler tractor that develops 30 drawbar horsepower and 5690 lb drawbar pull or push. The ⅝-yd Case-built loader applies 4300 lb breakaway force, lifts 2600 lb to over 9 ft height, and clears full 8 ft 10 in. after dumping. Dozer blades are standard Case sizes 71 in. x 23 in. bulldozer or 88 in. x 25½ in. angledozer.

J. I. Case Co., Racine, Wis.

For more details circle 108 on Enclosed Return Postal Card.



The New Aeroil Space Heater

Blower-Type Space Heaters

Aeroil Products Co. has designed and introduced a new line of blower type space heaters with B. T. U. outputs from 125,000 to 500,000 for use wherever portable, clean heat is necessary. These new units plug in an ordinary A. C. current and have an exceptionally high volume of air delivery without danger from carbon monoxide gas. The smallest will heat a construction enclosure space equivalent to an average five-room house. The fuel tank is large enough to keep the unit running all night. The initial cost is said to be low and the operating cost only a few cents an hour. Ask for Bulletin No. HE-1.

Aeroil Products Co. Inc., South Hackensack, N. J.

For more details circle 109 on Enclosed Return Postal Card.

(Continued on page 112)

His Allis-Chalmers "Dozers" spearhead levee job

Sweetman Construction Co. is building a levee near Sioux Falls, South Dakota—moving nearly one million yards of earth to end costly spring flooding of the Sioux river. Supt. William Bruhn and his spread of Allis-Chalmers HD-16 tractor-dozers spearhead the job. Bill and his operators think highly of the HD-16's. After months of heavy dozing, the tractors maintained a perfect "stay-on-the-job" record.

William Bruhn, Supt.
Sweetman Construction Co.
Sioux Falls, South Dakota

Allis-Chalmers tractor-dozer grades fill on levee. With hydraulic-controlled steering, the big, sure-footed HD-16 handles easily in heaviest material.

148-hp HD-16's handle big-tractor jobs with ease

The two-mile Sioux Falls levee job involves straightening and deepening the river bed—actually shifting the channel three quarters of a mile. Nearly one million yards of earth will be moved to excavate the channel and build the embankment.

Dependable Allis-Chalmers HD-16 tractor-dozers are spreading scraper-hauled fill, heaping muck for the dragline, leveling haul routes—setting a fast pace for other machines wherever they work.

Hydraulic steering a big help

Operators like the way they handle—the sure "feel" of the controls. Hydraulic-controlled steering takes the hard work out of maneuvering, even in the toughest dozing.

The HD-16's big, 148-hp Allis-Chalmers diesel engine delivers plenty of torque to lug through on heavy dozing—lively performance under all job conditions.

Easy servicing pays dividends

Like all Allis-Chalmers crawler tractors, the HD-16 requires lubrication *only once every 1,000 hours* for truck wheels, idlers and support rollers. This means a bonus of hundreds of production hours—a feature that pays dividends on anybody's job.

See what this great tractor can do for you! Six models to fit your needs. 148-hp, all-gear drive, 150-hp with hydraulic torque converter. Bare weight is approximately 33,000 lb. Ask your Allis-Chalmers dealer to demonstrate on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

. . . for more details circle 243 on enclosed return postal card

New Products

(Continued from page 110)

Some of the New Idler. From Top to Bottom. These 20-degree Idlers are 60, 48, 30, 24 in. and 14 in. wide Respectively.

Belt Conveyor Idlers

An expanded new line of belt conveyor idlers has been introduced by Link-Belt Co. Offered in five series and in widths ranging from 14 in. to 84 in., the new line includes more than 630 different types and sizes. The five series of idlers, designated as Series 5000 through 9000, make possible the exact matching of idlers to specific operating requirements of all belt conveyor applications. In addition to flat, 20-degree and 45-degree troughed idlers, there are rubber cushioned idlers for use at loading points, positive action and actuating disc training idlers, variable troughed idlers, and other types.

Link-Belt Co., Prudential Plaza Chicago 1, Ill.

For more details circle 110 on Enclosed Return Postal Card.

Small Transformers

Two new lines of low-cost core-and-coil transformers that are 15% smaller and lighter in weight than previous designs and which have all-welded "four-poster" construction for machine tool and panel applications, have been introduced by General Electric's specialty transformer department.

The new units, with standard or special regulation for machine tool applications, are available with terminal board, circuit breaker and fuse block accessories or with leads out. They are normally used to step down the voltage of 240-, 480-, or 600-volt distribution circuits to supply small individual loads for control circuits, hand tools, motors, utility outlets and work lights and 6- to 32-volt relays, lights and other similar signal devices. Voltage is stepped down at the load, eliminating the need for long secondary distribution circuits.

General Electric Company, Schenectady 5, N. Y.

For more details circle 111 on Enclosed Return Postal Card.

Blast Hole Loader

To mechanize the loading of fertilizer grade ammonium nitrate, Atlas Powder Company has developed the "Jetloder", a new machine which uses compressed air to blow the blasting agent, and also sand stemming, into place. Working tests have demonstrated that, as now developed, it can blow 2½ lb per second of ammonium nitrate and diesel oil mixture into a 50- to 60-ft horizontal blast hole. Four 80-lb bags were loaded into one hole in 2 minutes. Hand loading of the same material in the conventional way by a 3-man crew with jointed tamping poles would require about 30 minutes. Improved breakage is reported.

Atlas Powder Company's "Jetloder" for Ammonium Nitrate

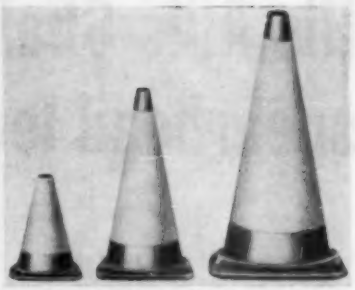
Beside the "Jetloder", the only basic equipment required is a compressor to provide air at 45 psi; a truck or other device to move the compressor, loading machine and supplies; and a sufficient amount of 1½-inch (ID) plastic pipe to reach from the machine to the back of the blast holes. Experiments are being conducted to determine the economy of the "Jetloder" in vertical hole work.

Atlas Powder Company, Wilmington 99, Delaware

For more details circle 112 on Enclosed Return Postal Card.

Traffic Cones

A new line of traffic cones, announced by Industrial Products Co., are finished with special rubber base paint in yellow, black and red color combination, plain or reflectorized. They are made of tough, durable rubber, and are of shell type construction for stacking. Three sizes are available: 12 in., 18 in., and 24 in.



New Industrial Traffic Cones

Industrial Products Co., 2924 N. Fourth St., Philadelphia 33, Pa.

For more details circle 113 on Enclosed Return Postal Card.

Diesel "Gumout"

Diesel "Gumout", added to the line of Pennsylvania Refining Co., is a special formula made for use in diesel engines of all types. It is said to dissolve and remove the gum and varnish that build up in the fuel systems. Injectors and injector nozzles are stated to be kept clean so the fuel can enter the cylinders in the proper spray pattern for complete and efficient combustion. In addition, the product is reported to remove water and moisture from the fuel thereby giving protection against rust and corrosion.

Pennsylvania Refining Co., 2686 Lisbon Road, Cleveland 4, Ohio

For more details circle 114 on Enclosed Return Postal Card.

New Steam Cleaner

Aeroil Products Company has announced the introduction of their all-new CL-S-400 heavy duty steam cleaner, with a capacity of 400 gal. per hour at pressures up to 150 psi.

The burner is of the downdraft type and will operate on either fuel oil or kerosene. A low-water cut-off is furnished to protect the coils in the event of water failure. Heating coils are of the drum type to permit complete drainage, and feature a built in desooter arrangement.

The compound tank has a three to six-hour capacity, depending on the degree of concentration. The compound is heated and agitated automatically and no pre-mixing is required. Steam gun is the full swivel type. Two-gun operation is available.

The CL-S-400 was primarily designed for heavy duty cleaning jobs such as construction equipment, trailer trucks, buildings, etc.

Aeroil Products Co., Inc., 7 Wesley St., South Hackensack, N.J.

For more details circle 115 on Enclosed Return Postal Card.

(Continued on page 114)

He increased production 20%

with an Allis-Chalmers tractor-dozer

Clyde Geraghty's Allis-Chalmers tractor-dozer really pays off in Alaska's semi-arctic conditions. The day-by-day dependability of his 66.5 net hp HD-6 makes 20 percent more operating time available.

Mr. Clyde Geraghty, President, Mitchell Truck & Tractor Service, Inc., Fairbanks, Alaska.

Dozes earth in summer

During Alaska's comparatively few weeks of summer, Geraghty's HD-6 works on road construction, clears homesites, digs basements, and landscapes. The tractor-dozer has plenty of power for these jobs.

Clears snowbound supply lines in winter

Through the long winter months, many families near the city and back in the bush are snowbound. They depend on Geraghty to keep roads to food and supplies open. His snow-clearing jobs range from a quarter mile to a full mile of road. Here's why Geraghty calls the HD-6 the best tractor we've ever owned.

Geraghty's HD-6 starts easily on the job site . . . is ready to work in a few minutes. Sure-fire, dependable direct electric starting right on the job saves from 5 to 10 gallons of fuel per month during the cold stretch.

Another reason for the increased production of Allis-Chalmers crawlers is the long lubrication intervals made possible by Allis-Chalmers design. There is no need for Geraghty to fight frozen earth to get at grease fittings—because the truck wheels, idlers and support rollers on his HD-6 need lubrication only once every 1,000 operating hours.

The advantages that Geraghty enjoys on the HD-6 are part of every Allis-Chalmers tractor-dozer. Models for every application range from 66.5 net hp to 225 net hp. Your Allis-Chalmers construction machinery dealer will be glad to demonstrate the machine you need on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

Summer in Alaska finds Geraghty pioneering roads, clearing homesites . . . during winter he uses his Allis-Chalmers tractor-dozer to keep vital supply lines free of snow.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

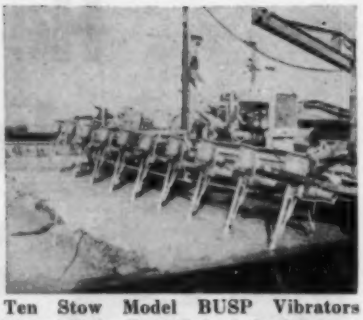
. . . for more details circle 244 on enclosed return postal card

New Products

(Continued from page 112)

Vibrator Assembly

A new gang vibrator assembly complete with generator, hydraulic lift mounting frame, brackets, and Model BUSP 2-hp electric generator, put on the market by Stow Manufacturing Co., is designed for attachment to concrete spreaders. Various combinations of vibrators, generators and mounting frames can be obtained to meet any specifications on slabs from 12½ ft to 25 ft wide. With the hydraulic lifting bar the vibrators can be lifted easily out of the concrete when not in use, or to set the vibrator heads at any height desired.



Ten Stow Model BUSP Vibrators Mounted in Semi-Raised Position on Concrete Spreader on Airport Runway Job

Stow Manufacturing Co., 65 Shear St., Binghamton, N. Y.

For more details circle 116 on Enclosed Return Postal Card.

Density and Surface Moisture Gauges

Two new probes—Models P21 and P22—developed by Nuclear-Chicago provide highly accurate moisture and density measurements directly on the surface of the material, eliminating the necessity of removing, weighing, or destroying test samples. Results are said to be in many cases more accurate and reproducible than those gained with conventional "non-nuclear" methods. As little as two minutes is necessary for precise moisture and density determinations.

A Complete d/M-Gauge System for Surface Moisture or Density Determinations Consists of a P21 Surface Moisture Probe or P22 Surface Density Probe (pictured above) and the Model 2800 Portable Scaler.

The instruments can be used on sand, clay, granular materials, asphalt, or concrete, and are especially suited to compaction studies and control of earth fills. They are also useful in agriculture. Results with the P22 surface density probe are reported as accurate within 2 lb. per cu. ft. wet density. The P21 surface moisture probe provides results reproducible within ½ lb. per cu. ft. moisture content.

Measurements are made by placing the P21 surface moisture probe, containing a fast neutron source, or the P22 surface density probe, containing a gamma-ray source, on a relatively smooth portion of the surface. The scattering of radio activity then indicates the density or moisture content.

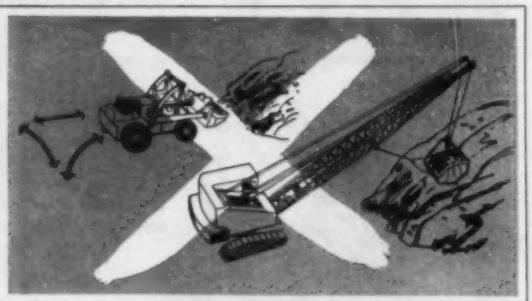
Nuclear-Chicago Corporation, 229 West Erie St., Chicago 10, Ill.

For more details circle 117 on Enclosed Return Postal Card.

Pneumatic Compactors

The newly established Eskridge Equipment Co. is building self-propelled, multi-tire pneumatic compactors (as shown) in a range of sizes from

Athey 125 HILOADER®



takes the "LOST MOTION" out of loading

Materials handling – loading raw materials – is a big expense in road building. You can streamline your loading program with the fastest loader of them all – the Athey 125 HiLoader! Athey straight-line loading eliminates the "load, swing, release and return" methods necessary with clamshells, shovels and front end loaders. Because of its endless belt and Full-Floating Feeder, the 125 can load sand, gravel, crushed rock, earth, etc. up to 10 cu. yds. per minute. So for lower cost – higher production – more profit with the Athey 125 HiLoader, see your Athey-Caterpillar Dealer today! Athey Products Corporation, 5631 West 65th Street, Chicago 38, Illinois.

Athey LOADERS...BY THE LEADER

... for more details circle 239 on enclosed return postal card

Eskridge 13-Wheel, 30-ton Compactor

9 tons to 30 tons; 9-wheel to 15-wheel units. The vertical oscillating wheels give equal compaction over the terrain. Eskridge is also building single, twin and triple roller crusher packs; road sweepers up to 8-ft broom widths; sheepsfoot rollers in both single and double drum models; custom built water-packs. The company also will manufacture special gear boxes, as well as designing and manufacturing complete units or components.

Eskridge Equipment Co., 1214 S. Norwood Ave., Tulsa 12, Okla.

For more details circle 118 on Enclosed Return Postal Card.

18-Yard "Euc" Scraper

Euclid Division of General Motors has announced a third model in the six-wheel 18-yd scraper line. This Model SS-18 is powered by a Cummins NHRS engine of 320 hp rating. It is equipped with a 10-speed transmission and 24.00 x 25 drive and scraper tires. Capacity is 18 yd struck—21 yd at 3:1 slope, and 25 yd heaped at 1:1. The scraper bowl can be interchanged with a 17-yd Euclid Bottom Dump.

Euclid Division, General Motors Corporation, Cleveland 17, Ohio

For more details circle 119 on Enclosed Return Postal Card.

Improved Kwik-Mix S-10 "Moto-Bug"

"Moto-Bug" Improved

A higher lift in considerably less operating time is now possible with the Kwik-Mix S-10 Model—"Moto-Bug". The previous 6-ft maximum lift has been raised to 7½ ft, while the time required to elevate a load (up to 1000 lb at 15-in. load center) has been reduced from 24 seconds to only 15 seconds. A flow regulator controls the drop.

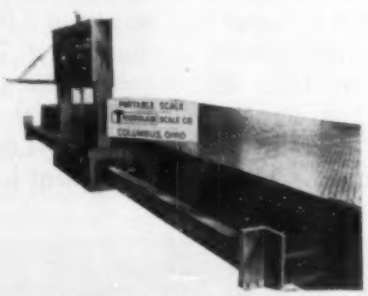
Telescoping mast on the S-10 fork lift is hydraulically operated, has a 10-degree back tilt and a 2-degree forward tilt. Forks can be adjusted from 6 to 32 in. widths to accommodate various sizes of loads. Standard forks are 20 in. long, with optional 30 in. lengths available.

Kwik Mix Co., Division of Koehring Co., 235 West Grand Ave., Port Washington, Wis.

For more details circle 120 on Enclosed Return Postal Card.

Portable Truck Scale

A new truck scale with rigid mount beam box has been announced by Thurman Scale Co. The model illustrated herewith is 27 ton gross capacity with a 24 by 9 ft fully covered steel deck. This scale is also available in other capacities and deck sizes.



New Thurman Scale, 27 Ton Capacity

Rigid scale design permits it to be transported from job site to job site without dismantling thereby saving installation expense. Heavy steel members support beam box at all times for complete safety and scale accuracy no matter how many moves are made.

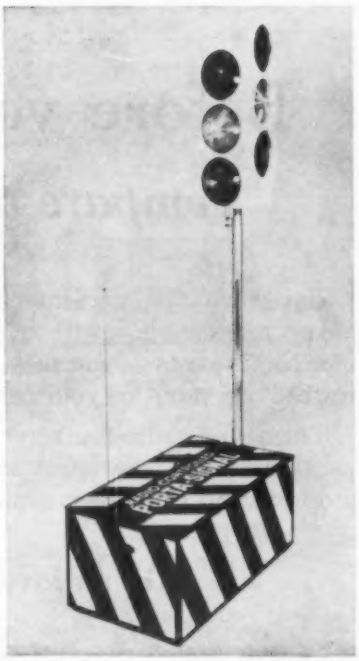
Thurman Scale Co., 156 North Fifth St., Columbus, O.

For more details cricle 121 on Enclosed Return Postal Card.

Portable Traffic Signal With Radio Control

A newly developed "Porta-Signal" offers remote radio control and portability in unusual combination with the features of a regular traffic light. A simple setting of switches allows the signal lights to be changed automatically at pre-timed sequences, operated manually by push-button, or set for caution flashing. Radio control at distances of several hundred feet is provided by means of a seven-ounce pocket-sized transmitter.

The battery-powered signal is self-contained in a compact aluminum case which can be carried by hand and acts as a base during operation. The signal head extends to a height of ten feet and is equipped with standard red, amber and green sun-proof lenses.



The "Porta-Signal" for Periodic and Emergency Traffic Control

"Porta-Signal" is designed to provide a dependable, economical and practical solution to temporary traffic control needs, such as occur at school crossings, accidents, highway construction detours, public gatherings and with rush-hour traffic loads. Other applications include use in classroom traffic instruction and control of vehicular and pedestrian traffic at military installations, industrial plant sites and entrances to night theatres.

Porta-Signal Division, Dryomatic Corporation, Alexandria, Va.

For more details circle 122 on Enclosed Return Postal Card.

Joint Sealant

A new sealing material which is unaffected by extreme temperature, expansion or contraction has been developed by Stonhard Co., Inc. It is called "Stonlast". It is claimed to form permanently weather-tight seals for cracks and joints in concrete, brick, metal, wood, or virtually any building material in use today.

Stonhard Company, Inc., Dept. 123, 1306 Spring Garden St., Philadelphia 23, Pa.

For more details circle 123 on Enclosed Return Postal Card.

(Continued on page 118)

Before you bid that next job . . .

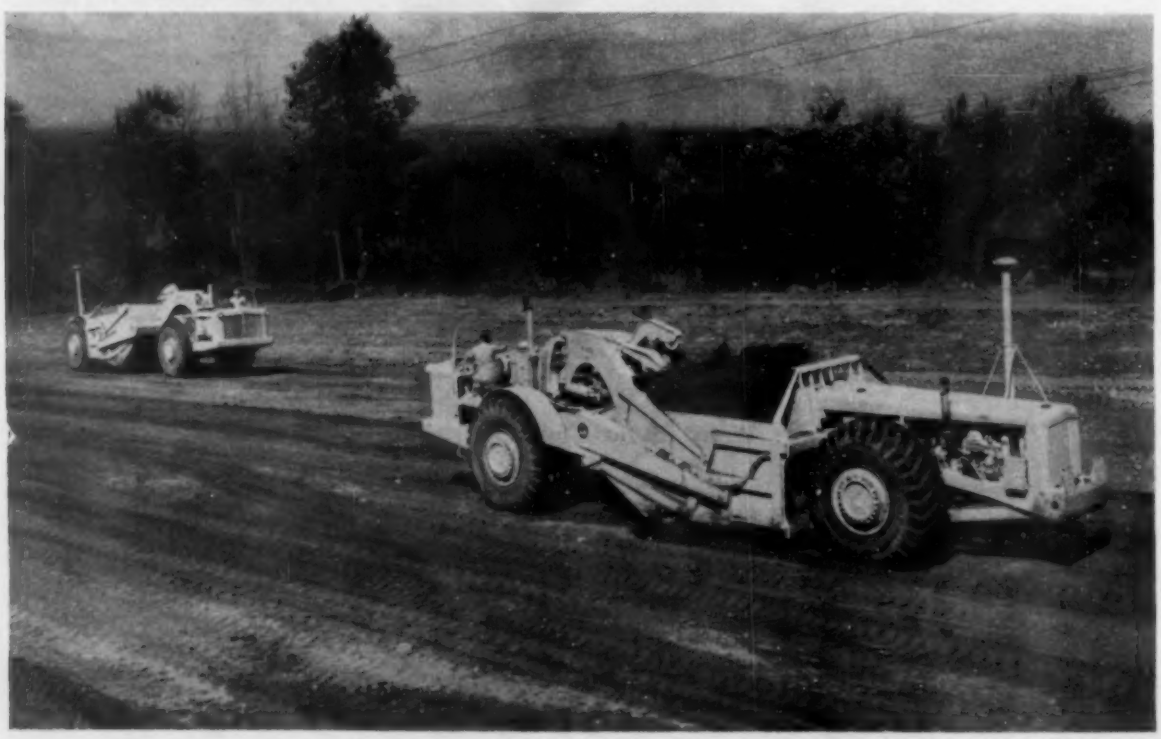
compare the earning power of "Twins"

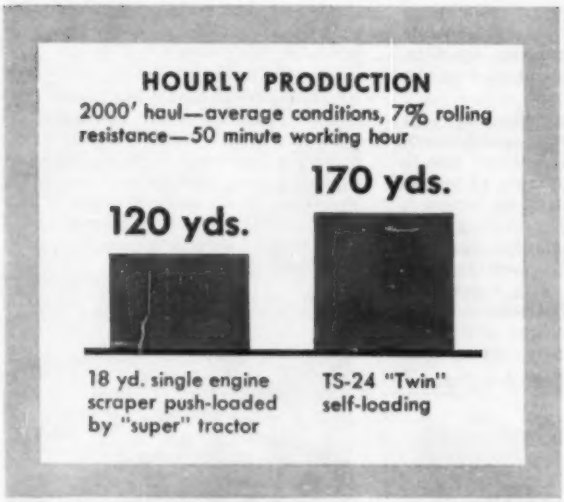
Unless your equipment can help you increase production — without a corresponding increase in costs — you may have a problem instead of a profit on your next job.

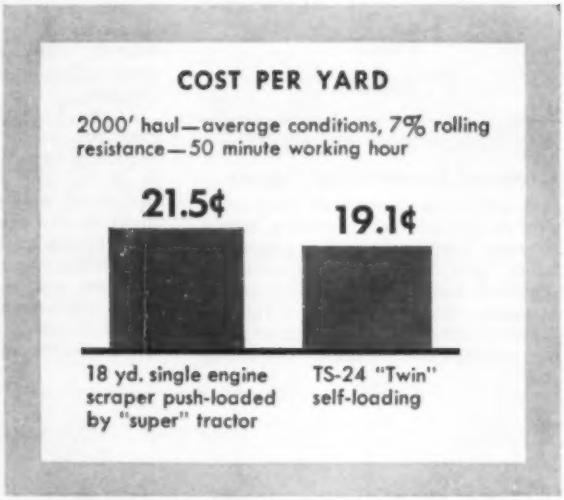
There's one sure-fire way to increase productivity — use the latest methods and the most efficient equipment available for the job, even if it means replacement or addition to your fleet. To stay competitive and still get your share of work — at a price that brings a profit — you simply can't afford to pass up the higher return on investment with new techniques and machines. Here's a typical comparison . . .

On an investment of $255,000 . . . 38% gross return

Suppose you have a spread of three 18 yd. single engine scrapers working on a 2,000′ haul. They're push loaded by a 300 h.p. "super" tractor and you're also using a motorgrader and 200 h.p. dozer and roller. Conditions are average (7% rolling resistance) so your scrapers produce about 360 yds. per hour. Total investment for the entire spread would be about $255,000 — an hourly cost of $77.30. That figures out to 21.5c a yd. Assuming a work season of 2,000 hours, you'd have a total production of 720,000 yds. At an average bid price of 35c a yd., gross revenue would amount to $252,000 and your dirt moving cost would total $154,800. The return is 38% on the equipment investment.

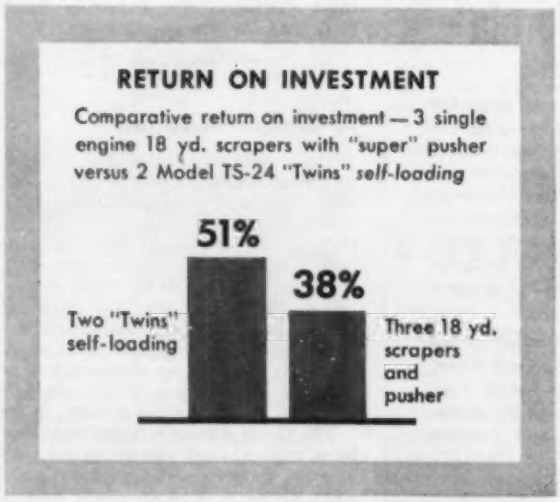



HOURLY PRODUCTION
2000' haul—average conditions, 7% rolling resistance—50 minute working hour
120 yds.
170 yds.
18 yd. single engine scraper push-loaded by "super" tractor
TS-24 "Twin" self-loading


COST PER YARD
2000' haul—average conditions, 7% rolling resistance—50 minute working hour
21.5¢
19.1¢
18 yd. single engine scraper push-loaded by "super" tractor
TS-24 "Twin" self-loading

16% *lower* investment . . . 33% *higher* return

Now, let's say you put two Euclid TS-24 "Twin" Scrapers on the same job and use the same grader and dozer. With the "Twins" self-loading in the average condition, a reasonable estimate of production would be a total of 340 yds. an hour. Total investment, with dozer, roller and grader, would be $214,000. Hourly cost of the complete spread would be $65.00, with a cost per yard of 19.1c. Season production of 680,000 yds. would produce gross income of $238,000 at 35c a yard. Your dirt cost of $129,880 would result in a 51% return on the equipment investment.


RETURN ON INVESTMENT
Comparative return on investment — 3 single engine 18 yd. scrapers with "super" pusher versus 2 Model TS-24 "Twins" self-loading
51%
38%
Two "Twins" self-loading
Three 18 yd. scrapers and pusher

The figures in the above comparison may not jibe with your cost figures but they're down-to-earth estimates of the built-in productivity of the "Twin". Based on your own experience, use production and cost figures that you're sure of and you'll find that Euclid "Twins" will give a tremendous bidding and profit advantage on any size and kind of job.

And don't overlook the bonus performance of the TS-24 that doesn't show in specs or calculations. For example, it's self-loading and independent of other equipment for pioneering work and small yardage jobs . . . it has all wheel drive that enables it to work earlier and later in the season, under conditions that keep other scrapers sidelined. And when you're really pressed for time and yardage, you can add a pusher tractor to get almost unbelievable hourly production.

With "Twins" in your fleet you can bid more work, more profitably and realize the highest return on investment. For facts and figures proof, and a demonstration on your job, see or call your Euclid dealer.

Engineered to fit the job . . .
Euclids are your best investment

EUCLID DIVISION
General Motors Corporation
Cleveland 17, Ohio

. . . for more details circle 274 on enclosed return postal card

New Products

(Continued from page 115)

Cement-Dispersing Agent

A new concrete additive designed to give maximum water reduction, higher strength, and better cement dispersion in all types of mixes is announced by Autolene Lubricants Company, manufacturers of the earlier established "Protex" air entraining solution. This new agent, PDA ("Protex" Dispersing Agent), gives field-proven economy in all phases of concrete placement while meeting rigid government specifications, according to statements from the company.

At the U. S. Naval (Buckley) Air Field project in Denver, specifications requiring flexural strengths of 600 lb in 28 days and a minimum of 7-sacks per cu yd were changed to permit a lower cement content, providing a water-reducing initial retarder was used and identical end results were obtained. Concrete was placed with 6-sacks per cu yd and one-fourth pound of PDA per sack, which permitted a 20% reduction in the unit water content. This mixture gave flexural strengths of more than the required 600 pounds and achieved this in only 14 days. A remarkable feature of this 11 to 13-inch concrete job was that it was placed during temperatures of 95°, concrete temperatures of 88°, wind velocities of 40 miles per hour, over large quantities of asphalt paving and showed negligible shrinkage cracks after 8 weeks. Complete satisfaction was reported.

Autolene Lubricants Company, Denver, Colo.

For more details circle 124 on Enclosed Return Postal Card.

LIMA Roadpacker speeds freeway construction near Colfax, California

Proper consolidation plays a large part in the speed with which McCammon-Wunderlich Co. and Wunderlich Contracting Co., Palo Alto, California, are completing their $3,650,000 state freeway contract on U.S. 40 east of Colfax.

These prominent contractors have been using the Lima Roadpacker, a big favorite for highway and airport construction throughout the country. It has no equal for fast, uniform consolidation by the vibratory method of single course macadam bases, gravel subbases and soil-cement bases.

The Roadpacker is equipped with six 420-lb. hydraulically driven shoes for effective vibrating and tamping action. These oscillate approximately ¼ in. at the right frequency for best consolidation of any base material. The force is applied vertically to prevent shoving the material being stabilized. The sole plate is designed for both forward and backward operation.

Working widths, easily varied by upfolding one or both of the end shoes, range from 8 ft., 9 in., with four shoes, to 13 ft., 1 in., with six shoes. The shoes are raised and lowered hydraulically.

Get all the facts on the Lima Roadpacker—write today for your copy of the Roadpacker bulletin.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON
Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

. . . for more details circle 245 on enclosed return postal card

"Michigan" Model 110 Four-Wheel Scraper

8-Cu. Yd. Scraper

A new "Michigan" Model 110 four-wheel scraper has a capacity of 8 cu. yd. struck and 10½ cu. yd. heaped. It is 27 ft. 7½ in. long, 8 ft. 4½ in. wide and 9 ft. 6 in. high. Empty weight is 14,450 lb; fully loaded 40,450 lb. Teamed with a Model 180 tractor dozer or equivalent prime mover, the Model 110 offers all-hydraulic control. The scraper's cutting edge consists of four interchangeable and reversible sections to permit offset or straight blade arrangements.

Construction Machinery Division, Clark Equipment Co., Pipestone Road, P. O. Box 598, Benton Harbor, Mich.

For more details circle 125 on Enclosed Return Postal Card.

A Bigger "Gradall"

Latest development of The Warner and Swasey Company is the Model G-100 "Gradall"—a 1¼-yard machine with a standard digging depth of 17 ft that can be increased to 23 ft with boom extensions. Its reach of nearly 31 ft can be increased to nearly 47 ft with these same extensions. The machine has a continuous 360° swing and the ability to lift up to 14,000 lb. It has a boom tilt (rotation on the boom's long axis) of 120° with a 360° boom tilt available as an optional feature.

The G-100 is quickly interchangeable from rubber tired carrier to crawler. The 8x4 carrier was designed and built especially for it. Primary power is from two 100-hp gasoline or diesel engines. Power for crawler travel is through four hydraulic motors, two for each track. Swing power is supplied through two hydraulic motors valved to incorporate two swing speeds. The speed shift is automatic, dependent on the weight of the load, insuring the operator suffi-

The G-100 "Gradall" Working in Shale

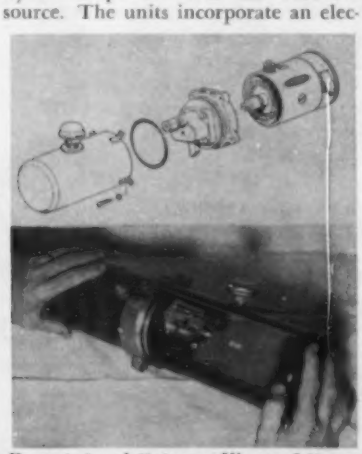
cient power under all conditions. Attachments available for Model G-100 include a 48-in. wide excavating bucket, a 10-ft wide clear span bucket for ditch cleaning, a 10-ft wide bucket-blade, a pavement removal bucket, a ripper tooth, and two push type buckets of 1¼ yd and 2½ yd capacity. Formed buckets up to 25 ft wide are available on special order.

Warner & Swasey Company, 5701 Carnegie Ave., Cleveland Ohio

For more details circle 126 on Enclosed Return Postal Card.

Electric Powered Hydraulics

Borg-Warner's Wooster Division offers a new line of low-cost, self-contained, power packages producing hydraulic power from an electric source. The units incorporate an elec-



Exploded and Cutaway Views of Power Package—the Latter Showing pump housing contained within the single-piece deep drawn reservoir.

tric motor, hydraulic gear pump with integral relief valve, check valve, and reservoir.

The package is designed to handle a wide variety of work loads, even loads as great as those encountered in snow plows, tailgate loaders, tractors and lift trucks. Capacity of the gear pump ranges from 0.36 to 0.80 gpm. Perfect control of the load is claimed under all conditions. Reservoir capacities range from 0.43 to 1 gal.

The Wooster line of motors, developed specifically for the new power package, may be open-ventilated, totally enclosed, or standard starter type motors. They are available for operation from a 6, 12, or 24-volt dc source. Rotation can be in either direction or reversible.

Wooster Division, Borg-Warner Corporation, Wooster, Ohio.

For more details circle 127 on Enclosed Return Postal Card.

Tractor-Loader

A new tractor-loader industrial "package", announced by Ford Motor Co's. Tractor and Implement Division, has two and a half times the lift capacity of any previous Ford loader unit. The new "Super-Duty" loader, has a 2500 lb lift capacity, 5500 lb break-

New Ford Tractor-Loader

away limit, and bucket sizes up to 1 cu yd. The tractor can carry up to 7000 lb on its front axle, and is designed to isolate driver and engine from the shocks encountered in rugged industrial service. Two tractor models, the 1821 and 1841, are offered with gasoline or diesel engines.

Tractor and Implement Division, Ford Motor Co., Birmingham, Mich.

For more details circle 128 on Enclosed Return Postal Card.

Fluid Power Pump

An improved gear type fluid pump, the 3000 K Series, announced by Hydreco Division, is rated at 24 to 65 gpm at 1200 rpm, for operating pressures to 1500 psi and operating speed to 2400 rpm. These pumps are built with a special two-stage high pressure shaft seal and new design roller bearings especially for applications on heavy duty earth moving and similar mobile equipment. They are available with either standard S.A.E. flange and shaft or industrial foot mountings. Ports are machined for S.A.E. split flange connections.

Hydreco Division, The New York Air Brake Co., Kalamazoo, Mich.

For more details circle 129 on Enclosed Return Postal Card.

E/E Portable Cement Silo

Portable Cement Silo

A new portable cement silo has been placed on the market by Engineered Equipment, Inc. The 8-ft diameter unit has a capacity from 125 to 250 bbl, and the 10-ft has a capacity from 125 to 460 bbl. A bucket elevator is built integrally with and inside the silo to conserve space. Both sizes are available with or without 30 to 50 bbl "up-stairs" storage from which to charge separate cement batcher. Manual or automatic scales are optional.

Engineered Equipment, Inc., Waterloo, Ia.

For more details circle 130 on Enclosed Return Postal Card.

Portable Batch Plant

A new portable concrete batching plant, announced by Aeroil Products Co., is available in 3½-yd and 6-yd sizes. The weigh hopper features a new, easy method of introducing cement to the batch.

The plant is four-wheel mounted and is available with either gas engine drive or electric motor. Water meters are optional equipment. A three-beam scale with over-under indicator is furnished as standard equipment. Dial scale heads are optional.

The total weight of the plant is approximately 7,500 lb. Overall width is 7 ft and overall length is 36 ft 6 in.

Aeroil Products Co. Inc., 7 Wesley St., So. Hackensack, N. J.

For more details circle 131 on Enclosed Return Postal Card.

Short Range "Geodimeter"

"Geodimeter" Model 4, for measurements from 300 ft to 5 miles is now in production. It is designed specifically for traversing—in distinction from Models 2 and 3, which are primarily for geodetic and large-scale photogrammetric control. Model 3, with a range of more than 20 miles, was described, together with an outline of the operating principle on page 114 of Roads and Streets for August. The reflectors for use at observed stations are of the "corner cube" prism type, and require pointing only to within 20° of the "Geodimeter" position. No attendance is necessary.

Measured distances are determined immediately from the instrument panel with the use of precomputed tables. Time for a single observation with the Model 4 is about 15 minutes. The ac-

(Continued on page 122)

ONE PAYLOADER®

...but it's...
a BULLDOZER
a CLAMSHELL
a SCRAPER
a SHOVEL

A SINGLE INVESTMENT GIVES YOU 4-MACHINE UTILITY

One of the many useful attachments available only on a "PAYLOADER" in the rubber tired tractor-shovel field is the patented DROTT 4-in-1 bucket. With this bucket your "PAYLOADER" handles many more jobs than any other tractor-shovel... enables you to do jobs you may now be doing with hand labor... eliminates the need for several special machines... and it keeps your "PAYLOADER" busy every hour, every season.

It's a bulldozer

By raising the front lip, you have a rugged bulldozer blade that rolls the earth forward. Blade pitch can be altered hydraulically and you can penetrate well below ground level. If you desire to transport the spoil, you can merely close the front lip over the load and you have a normal bucket operation. Ideal for spreading materials also, as amounts can be varied as desired by bucket lip openings.

It's a clamshell

Enables you to pick up any material from stockpiles or windrows; grasp huge rocks, stumps, etc. because bucket opens wide and true clamshell action picks up the load without tractor travel. Ideal for picking up loose piles of materials on paved surfaces and on land clearing projects. Loads are dumped by merely opening the clamshell.

It's a scraper

With the clam lip partially open, you have a handy scraper that loads itself as the machine travels forward. The dozer moldboard boils the dirt up into the bucket and when the lip is closed the load can be carried wherever desired and dumped completely or spread in thin layers. It strips sod or grades and levels with extreme accuracy.

It's a shovel

The 4-in-1 can always be used as a regular shovel bucket to excavate, load, carry and dump in the regular manner. Pry-out pads and bucket tip action enable you to provide tremendous break-out action in tough digging and full bucket loads at all times. Bucket is dumped in normal manner or opened as a clamshell.

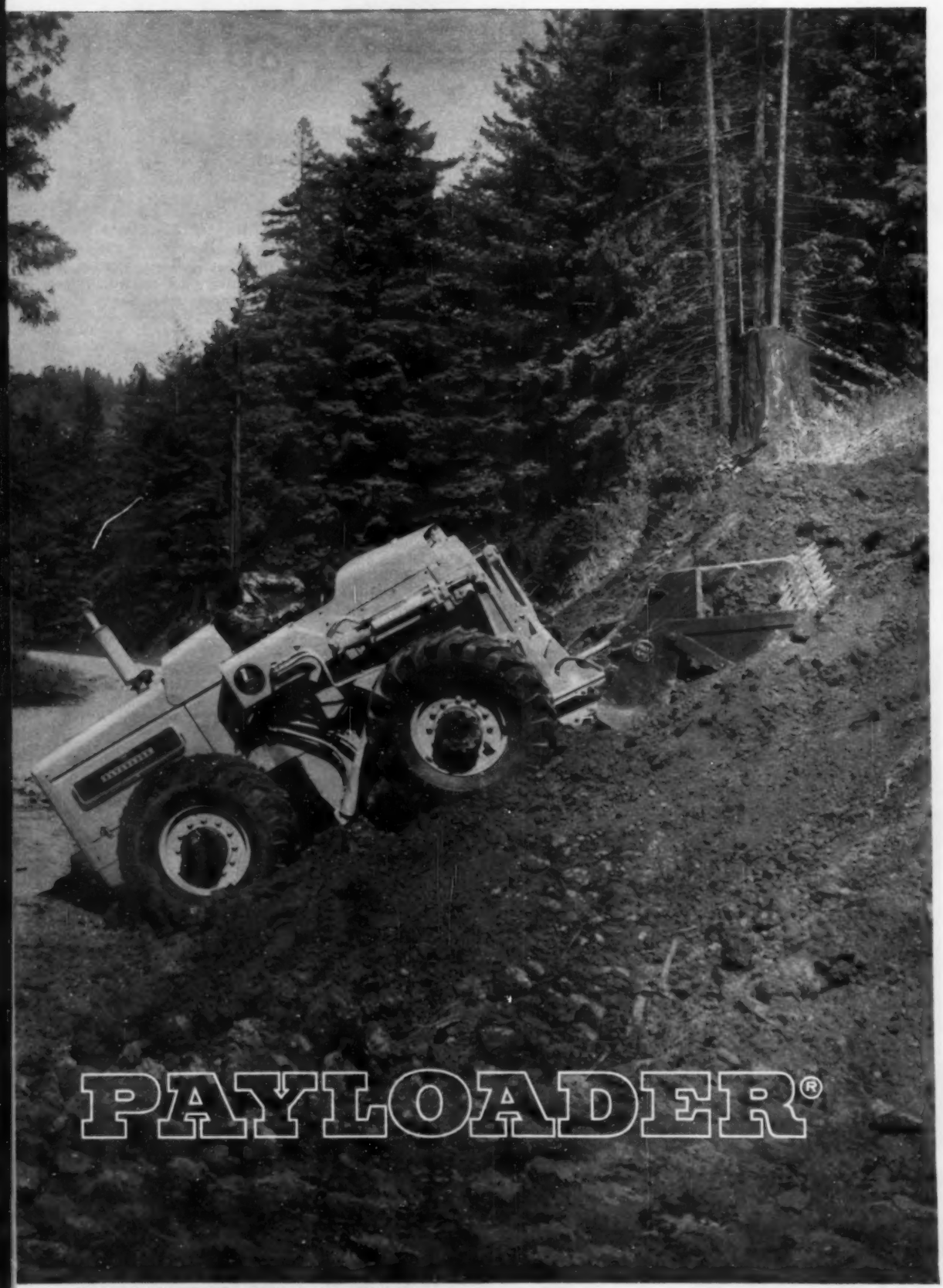
No other tractor-shovel gives you the versatility of a "PAYLOADER" and its attachments. In addition to the 4-in-1 bucket, there are Back-hoes, Spreaders, Side Booms, Lift Forks, Crane Booms, Sweepers and Snow Plows... plus special buckets to fit any job. Your "PAYLOADER" distributor will be pleased to discuss your problems and provide complete information — or return the coupon for full details. The Frank G. Hough Co., Libertyville, Illinois.

THE FRANK G. HOUGH CO. 11-8-3
768 Sunnyside Ave., Libertyville, Ill.
Send full data on 4-wheel drive "PAYLOADER" models with DROTT "4-in-1" buckets to:

Name _____
Title _____
Company _____
Street _____
City _____ State _____

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY


PAYLOADER®

New Products

(Continued from page 119)

The No. 4 "Geodimeter"

curacy on any line from 50 ft to 5 miles is ±0.06 ft, but distances under 300 ft can generally be measured faster by tape. The instrument measures 19x11x12 inches and weighs 35 lb in contrast with the 68-lb Model 3. This weight is exclusive of the 60-watt power supply, which can be either generator or battery.

Mounting is with a special head, adjustable vertically and horizontally, and designed to fit a sturdy theodolite tripod. Horizontal and vertical circles are provided for approximate angles, but precise survey angles must be made by transit or theodolite.

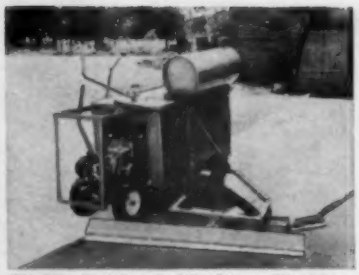
Beside its application in the running of highway and other traverses, the "Geodimeter" is uniquely adapted to "polar surveys", in which distances and angles to various points are taken from a single central set-up.

Geodimeter Company, a Division of Berg, Hedstrom & Co., 1170 Broadway, New York 1, N. Y.

For more details circle 132 on Enclosed Return Postal Card.

Blacktop Applicator

A new power-driven Higbee-Reichard machine, announced by Maintenance Engineering Co., is claimed to apply seal-coat material to paving at a rate of 600 sq ft per minute. The machine is designed to apply all types of cold emulsified liquid tar or asphalt, with or without sand or asbestos filler. The self-propelled machine, which operates forward or in reverse, piles excess material into a small windrow at the edge, which keeps it from setting-up



Higbee-Reichard Blacktop Machine

until the next pass has been made—thus permitting a non-raveled, uniform blend between successive passes. A new and improved "Black Magic" surface seal containing petroleum resistant latex has been announced along with the applicator. The addition of this seal is said to improve the flow of the material at the time of its application, and to increase its bonding and wearing characteristics.

Maintenance Engineering Co., 16 West Johnson St., Philadelphia 44, Pa.

For more details circle 133 on Enclosed Return Postal Card.

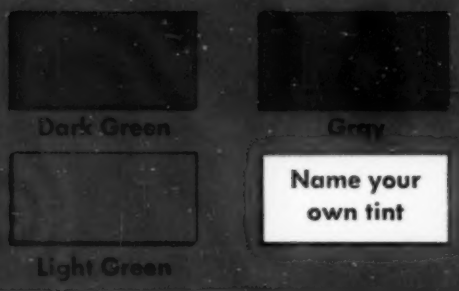
Driver-Breaker-Driller

A new "Trac-Hammer" that can be used for concrete breaking, pile driv-

(Continued on page 125)

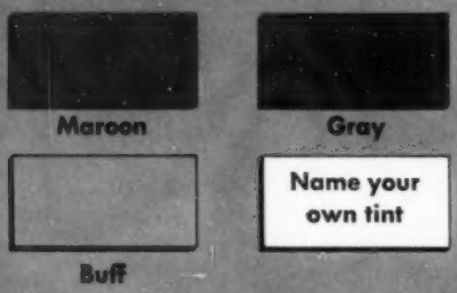
ANOTHER
BMCO
FIRST!
13
WHEEL
SELF-PROPELLED ROLLER
NOW . . . YOU CAN CUT YOUR COMPACTION TIME IN HALF!
This new exclusive BMCO 13 wheel roller makes it possible for you to do the same amount of work in half the time!
With complete oscillation on all wheels and power steering this 13 wheel BMCO compactor is easy to handle. With the largest power unit in its class and extra displacement . . . this is the compactor for you in '58.
For more information write, wire, or phone!
MORE COMPACTION
FEWER PASSES
50% LARGER
BMCO
BROWNING MANUFACTURING CO.
111 HUMBLE AVENUE
P. O. BOX 2707
SAN ANTONIO 6, TEXAS

. . . for more details circle 250 on enclosed return postal card

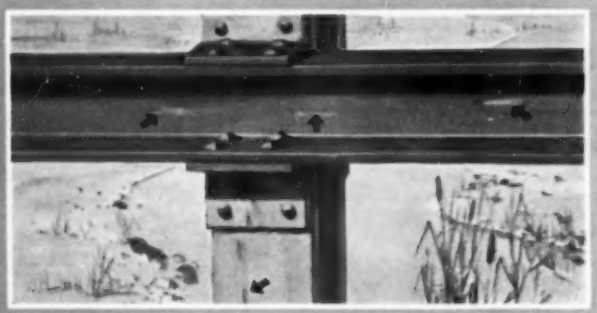


Never before weather-resisting tinted *finishes* that are also rust inhibitive . . .

Now you can give steel structures distinctive color . . . or decorative color . . . along with greater durability than ever



Never before tinted *intermediates* that are *both* weather resistant and rust inhibitive . . .



Now you can specify intermediate colors in sharp contrast and aid visual inspection for "holidays"

Never before anti-corrosive *primers* that are also tintable and weather resistant.

Now you can eliminate on-the-job mix-ups by using structurals shop-primed in *coded* M50 pigment colors

Proof M50 pigment Defense in Depth paints deliver color opportunities entirely beyond those of ordinary anti-corrosive paints

Wide color choice has never before been available in *all* coats of anti-corrosive specification paint systems. Now *M50* basic lead silico chromate pigment* gives you an entirely new color specification freedom . . . in primers as well as intermediates and finishes . . . along with all-coat rust inhibition, all-coat weather resistance. Some of the opportunities this presents are suggested above. You'll think of others.

M50 Defense in Depth

. . . And never before such *durable* color. See next page for proof . . .

*Registered trademark of

National Lead Company

General Offices: 111 Broadway, New York 6, N. Y.

For more facts, turn page

A. No visible discoloration from atmospheric conditions

Contrast areas marked **A** in photo (top at right) of paint test panels exposed 18 months. You can see *M50* pigment paint is free of discoloration caused by atmospheric conditions.

B. No objectionable whitening from normal chalking

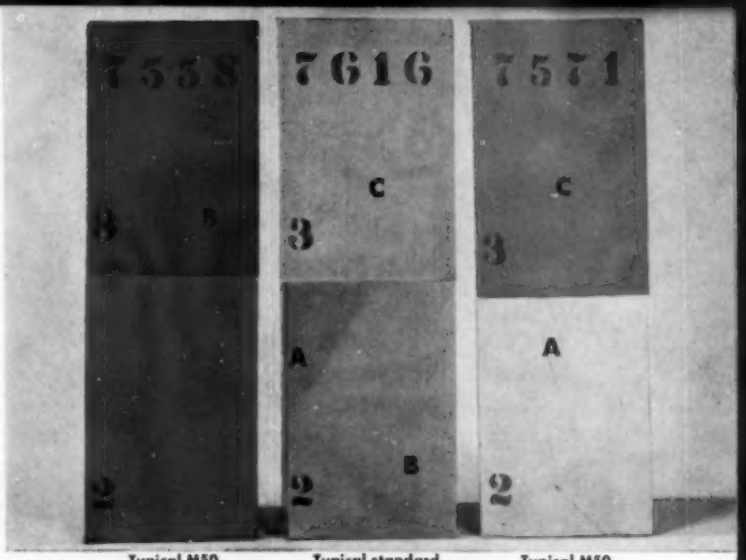
Now compare areas marked **B**. Notice the brightness of color in the *M50* pigment paint. A finger drawn across this paint shows no mark from rubbed off chalk.

C. No noticeable leaching from water action

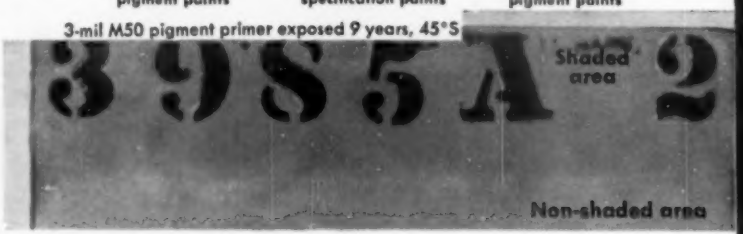
Look closely at areas marked **C**. Can you see where the non-*M50* paint has been leached by rain water to expose vertical brushmarks in the undercoat? Insoluble *M50* pigment prevents this film failure.

D. No excessive fading from light action

This time examine the close-up (bottom photo at right) of a 9-year *M50* pigment primer exposure test. Contrast between the area shaded by a wooden panel holder and the non-shaded area shows excellent tint retention conferred by *M50* pigment.



3-mil M50 pigment primer exposed 9 years, 45°S



M50 pigment paint tints stay brighter, retain hue longer ...they're protected against all 4 causes of color loss

No need to amplify what the illustrations on this and the preceding page show. Plainly, *M50** pigment Defense in Depth paints give you more color freedom, more color durability than ever before available in metal protection paints. More rust inhibition, more weather resistance, too. In every coat!

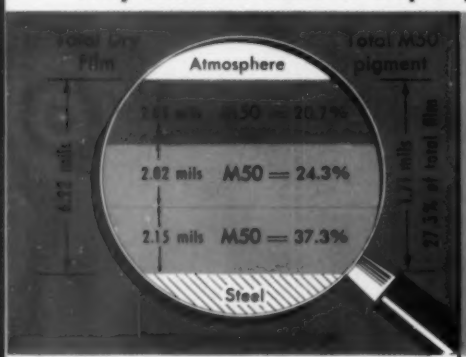
Where to get *M50* pigment Defense in Depth paints

National Lead makes the pigment, not the paints. So the place to go for *M50* pigment specification paints themselves is your regular supplier. However, National Lead can help you familiarize yourself with these new paints in four ways: (1) show you *M50* pigment paint exposure test panels at its Sayville, L. I. Test Station; (2) send you a 24-page descriptive brochure, "Defense in Depth." (Mail coupon below); (3) provide technical aid in test applications; (4) help you develop suitable specifications for paints containing *M50* pigment.

For M50 pigment paints themselves, contact your regular suppliers.

*National Lead Company trademark for a basic lead silico chromate pigment

Why M50 Defense in Depth paints give you metal protection beyond all former concepts



In every coat...rust inhibition! Fused lead chromate is noted for rust-inhibition. The *M50* pigment particle structure permits paint makers to include large proportions of lead chromate in all coats of anti-corrosive systems.

3985A 2
2 M50 pigment alkyd primer coats
Exposed 9 yrs 45°S
Each coat 1.5 mils dry film
M50 pigment finish put on rusty steel
Exposed 4 yrs 45°S
In industrial atmosphere
3.0 mils
1.5 mils

In every coat . . . weather resistance! *M50* pigment is insoluble in water and has the excellent tint retention properties of fused lead chromate. Unlike other rust inhibitors, it actually boosts weather resistance of paints.

In every coat...your choice of colors! *M50* pigment gets along well with most tinting pigments, permits paint makers a wide range of colors...not only in intermediates and finishes but in primer coats as well. Colors stay true.

M50 Defense in Depth

National Lead Company,
111 Broadway, New York 6, N. Y.

Gentlemen: Please send me your 24-page brochure, "Defense in Depth." Include color card of the six *M50* pigment paints you recommend for steel highway structures.

Name_____ Title_____

Firm or Dept._____

Address_____

City_____ State_____

New Products

(Continued from page 122)

ing, or drilling operations has been announced by Vulcan Iron Works and Gardner-Denver Co. It is an application of the Vulcan portable pile hammer adapted for use on Gardner-Denver's "Air-Trac" drilling rig.

"Trac-Hammer"

The new machine features an "all-angle" boom enabling it to drive piles or drill holes from virtually every position. When pile driving or breaking work is called for, the hammer can be united with the "Trac" by a mounting bracket attached to the mast.

The hammer operates from an air pressure of 60 lb per sq. in. and is capable of delivering 303 blows per minute with a "striking part" weight of 100 lb. It has a rated striking energy of 386 foot pounds. Easily portable, the hammer weight is 786 lb, complete with striking plate.

Gardner-Denver Co., Quincy, Ill. Vulcan Iron Works, Chicago, Ill.

For more details circle 134 on Enclosed Return Postal Card.

Road Job Dust Layer

An inexpensive chemical preparation for overcoming dust on road construction projects has been announced by American LaFrance. The product called "Pentrate", is a liquid chemical which has the unique property of increasing the wetness, or penetrating power of ordinary water. One part of Pentrate is poured into 500 parts of water to make the working solution.

American LaFrance Corporation, Elmira, N. Y.

For more details circle 135 on Enclosed Return Postal Card.

Chemical Softens Concrete

A newly formulated, complex nitrogen chemical known as "Chem-Break" is said to have a remarkable ability to soften cement. Manufacturer's instructions are—"Dissolve in cold water. Pour onto concrete surface. Break surface slightly with jack hammer, and add "Chem-Break" solution to the break. "Chem-Break" softens the concrete, saves time on the job, and reduces costs . . . Safe to use near brick or metals. No fumes, but workers should avoid contact."

Lee Revere and Van Buren Chemical Co., 432-436 West 70th Terrace, Kansas City 13, Mo.

For more details circle 136 on Enclosed Return Postal Card.

(Continued on page 144)

Plowing an AIRPORT or PARKING LOT, CITY STREET or EXPRESSWAY . . .

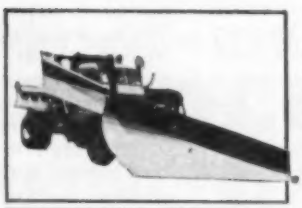
Think of

FRINK

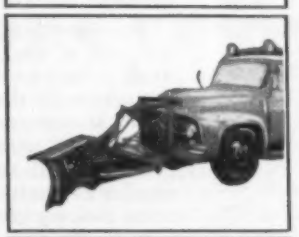
—The Plow Designed for the Power and Performance to Meet YOUR Snow Removal Needs

Whether snow removal problems in your area require a high-speed, heavy-duty V-type plow (**above**) or a lighter, maneuverable Reversible type, Frink has the plow specifically designed to do the job . . . faster, safer, at lower cost.

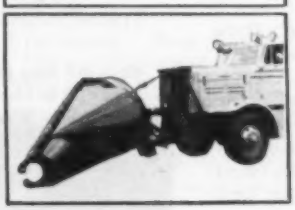
Frink, the pioneer in advanced snowplow design for 35 years, makes four basic types of plow, each with models to fit 1½ to 12 ton trucks . . . and most are interchangeable on same truck attachment. Get full details from your Frink distributor or write Frink for descriptive folders about any of these plows —



ONE-WAY Snow-Plow with Trip Blade
Finest speed plow made . . . tapered, curved moldboard throws and spreads snow to minimize deep banks, yet windrows neatly at city speed.



REVERSIBLE PLOW with Trip Blade
The all-purpose plow . . . throws right or left, or bulldozes straight ahead . . . cab lever sets position automatically, even while plowing.



ROLL OVER Plow with Taper Blade
Made only by Frink . . . can rotate to left or right position in 15 seconds . . . high-speed for deep snow . . . ideal for airports and dual highways . . . ends deadheading . . . easier to park.

V-TYPE Sno-Plow (shown at top)
Rugged powerhouse for heavy-duty plowing . . . self-ballasting to keep nose down, prevent side thrust . . . bevels side banks . . . will not wedge . . . safe at high speed . . . economical in use.

For Snow Plow Know-How It Pays to Think of FRINK SNO-PLOWS

Clayton, 1000 Islands, N. Y.
Frink Sno-Plows of Canada, Ltd., Toronto, Ontario
. . . for more details circle 269 on enclosed return postal card

● **(*Left*): One stroke has severed roots. (*Middle*): Downward splitting stroke being made into stump. (*Right*): Demolished stump being removed by inward pull on the axe. Operator can control depth of removal.**

Contractor's Husky Stump Splitter

Heavy-duty backhoe attachment reduces large stumps to quickly burnable chunks; said to cut equipment costs on highway clearing.

THE M. J. Bles Construction Company of McLean, Virginia, has recently perfected a new clearing and grubbing tool which makes it possible to uproot a stump of any size in a few minutes, and at the same time split it into fine pieces for burning after brief air drying. None of the split chunks is larger than two men can handle; many are right for fireplace wood.

This is a radical change from stump removal methods heretofore in local use which call for uprooting, loading, hauling and disposal of each stump and the use of bulldozer, crane and truck with the added problem of finding a place to bury the stump.

The accompanying pictures show graphically what this contractor has done with his Bles Stump Axe. It can be mounted on any ¾-yd. crane or shovel. In developing this tool Bles experimented with different kinds of weights of steel in an effort to get the best performance and still keep the weight of the axe and boom within the 5-ton range. The last model has removed over 2,000 stumps. While this tool is relatively new, the company feels it has finally come up with an ideal axe.

The pilot model was first tried out around Christmas, 1957. Over 5,000 stumps have since been removed in trying out the various blades, including a subcontract of 50 acres of the heaviest timber in northern Virginia. In an actual operating time of 325 hours, 2,714 stumps were removed, or an average of one every 7.18 minutes including time spent moving the machine, grinding the axe and oiling.

Four operators were used on this job, two of whom had never operated a backhoe before and none familiar with the axe. Two-thirds of the stumps were over 3 ft. thick and cut to within inches of the ground. (All stumps 12 in. and smaller had been removed by a previous clearing contractor.

Thirty percent of the work was performed under very adverse conditions; in fact it was so wet that it became necessary to bolt chains to the pads to keep from skidding all over the hills. In this instance the roots and fragments were piled by a D4 dozer with root rake attachment.

Taking into consideration the pay of the axe operator, dozer operator and the laborer who tended the burning, plus cost of fuel oil for igniting the green stumps, there was a total direct cost for labor and material of approximately 70 cents per stump, or a saving on these items of at least 75 percent over Bles' previous methods. In arriving at this figure no attempt was made to determine costs of rentals of backhoes or dozer because each contractor has his own figures for his equipment.

According to Bles, representatives of various firms have come to watch the operation of this new tool. G. Y. Carpenter of Alexandria, Virginia, a consulting engi-

● **Showing Bles axe in relation to the excavator machine used. Stump being removed is on hard-to-reach slope.**

neer who has retired from service with the Bureau of Public Roads, said that the axe marks the "greatest advance in its field since the bulldozer." He pointed out that it is adaptable to large stumps as well as small ones. Also that the axe is a cost cutter as there is much less expense in backfilling the small and shallow holes left.

Further improvement of the axe include the use of a removable cutting edge. Experiments are being made with different types of metal. The contractor has gone into manufacturing the axe for others, the axe now does not have the replaceable edge but is hardfaced.

So goes the evolution of a new clearing tool which, like many another piece of equipment, owes its evolution largely to a contractor's urge to develop lower cost methods.

AGC Forms Joint Group With Supply Associations

A national joint cooperative committee has been formed by the National Sand and Gravel Association, the National Ready-Mixed Concrete Association, and the Associated General Contractors of America. It will be known as the Concrete and Aggregates Producers-Associated General Contractors Joint Cooperative Committee.

The committee will handle problems arising from the highway expansion construction under the long-range federal-aid program and the steady increase in dollar volume of construction activity.

Robert Mitchell, Consolidated Rock Products Co., Los Angeles, is co-chairman for the ready-mix and aggregate groups.

AGC President Fred W. Heldenfels, Jr., Corpus Christi, Texas, appointed following contractors:

R. W. McKinney, Nacogdoches, Texas., co-chairman; B. B. Armstrong, Armstrong & Armstrong, Roswell, N. M.; M. B. Findorff, J. H. Findorff & Son, Inc., Madison, Wis.; Max C. Harrison, Harrison Construction Co., Pittsburgh; D. J. Mooney, Cahill-Mooney Construction Co., Butte, Mont.; L. S. Bradshaw, L. S. Bradshow & Sons, Salisbury, N. C.; W. A. Bechthold, Payne & Dolan of Wisconsin, Inc., Milwaukee, and F. Roland Sargent, Sargent Construction Co., Saginaw, Mich.

Committee co-secretaries are Vincent P. Ahearn, Washington, D. C., executive secretary of National Sand and Gravel Association and National Ready-Mixed Concrete Association, and J. M. Sprouse, of Washington, manager of AGC's Highway Contractors' Division.

Form bridge piers for less cost...quicker!

Bridge near Plymouth, Iowa
Iowa State Hwy. Commission, designers.
Bragan Construction Company, contractors.

For round columns of concrete, use

SONOCO
Sonotube®
FIBRE FORMS

Piers for bridges on Rt. 288 between U. S. 65 and Plymouth, Iowa were formed with 18" I.D. Sonotube Fibre Forms. The round concrete columns are 17' high and are spaced 3' on center . . . span is 120'.

Contractors and engineers from coast-to-coast have used Sonotube forms in a wide variety of structures and know that they provide the quickest and most economical method of forming concrete columns.

With any of Sonoco's three types of fibre forms, Seamless Sonotube, "A" Coated Sonotube or "W" Coated Sonotube . . . you save time, money and labor!

Order in sizes from 2" to 48" I.D. in standard lengths of 18 feet. Other lengths can be furnished to meet special requirements. Can be sawed to size on the job.

See our catalog in Sweet's

• HARTSVILLE, S. C.
• LA PUENTE, CALIF.
• MONTCLAIR, N. J.
• AKRON, INDIANA
• LONGVIEW, TEXAS
• ATLANTA, GA.
• BRANTFORD, ONT.
• MEXICO, D.F.

3085

For technical information and prices, write

SONOCO
Construction Products
SONOCO PRODUCTS COMPANY

. . . for more details circle 311 on enclosed return postal card

Court Decisions for Contractors

Damage Repair Obligations

Contract for street improvements in Assaria, Kans., provided, in part, that the contractor should be liable for all damages and at his expense, in such event, should repair or replace, with a stipulation agreeing to arbitrate on failure so to do. A dwelling and its contents were destroyed by fire when a bulldozer fractured a gas pipe line located near this property.

When the property owner recovered judgment for his loss after the contractor had refused to replace the damage, the Supreme Court of that state said, in affirming the judgment, "When demand was made upon the contractor for the damages sustained he had the right to make amicable settlement and might properly have made the same on the basis of replacement cost less depreciation.

"However he wrongfully refused to perform pursuant to either method although the claim for loss subsequently sustained by the jury, was submitted to them. Such refusal constituted a breach of the contract and a repudiation of an obligation enjoined upon the contractor by these provisions."

Anderson v. Rexroad, 306 Pac. 2d 117, Kansas, January 12, 1957

Contract Modified

By Albert Woodruff Gray

Contract was made by the United States and the Mount Vernon Construction Company for the paving and draining of a landing field at Newburgh, New York. It was there stipulated that the Government reserved the right to make changes in the work within the general scope of the contract and that the Government, if the changes caused an increase or decrease in the amount due under the contract, or in the time required for its performance, should make an equitable adjustment in price and time. Further, there was reserved to the government the right to stop the work when conditions were determined unfavorable to its prosecution.

Subsequently suit was brought by the contractor for damages for what it claimed was a breach of the contract. Refusing to grant the relief asked, the court said, "The Government makes changes in the amount and method of work with regard to excavation and the placing of gravel. The changes are necessary to make a safe landing field but they delay the completion of the excavation and gravel work and consequently delay the paving work.

"The Government pays the prime contractor for the increased yardage involved in the changes and for the increased difficulty of the work done by the changed method. We do not understand that either the change orders or the stop orders were unreasonable."

Mount Vernon Construction Corp. v. United States, 153 F.S. 469, U. C. Court of Claims, July 12, 1957.

"RAM" EATS SNOW—*fast!*

● Wet or dry . . . light, packed or icy . . . the "Ram" Rotary Snow Plow on a "PAYLOADER" Tractor loads a 10-yd. truck under 60 seconds—keeps 9 trucks busy.

It's fascinating to watch a Ram Rotary Snow Plow with a "PAYLOADER" Tractor walk steadily along the street and literally eat up the snow. Wind packed drifts or hard, icy piles, it makes no difference—and the Ram *positively will not clog* with wet snow. For clearing city streets it keeps a fleet of trucks on the dead run. For highway clearing it blows snow sideways up to 100 feet. You can't jam a Ram—it's a glutton for snow.

The Ram Rotary Snow Plow is a husky front mounted, independently powered unit, interchangeable with buckets on the "PAYLOADER" Tractor, equipped with stack for truck loading or blowing snow up to 100 feet. Adjustable skids, replaceable cutting edge, safety shear pins throughout. Built in 3 sizes, it's a rugged power packed unit proven by years of use.

Ram Rotary Snow Plow with "PAYLOADER" Tractor at work last January in Waukegan, Ill. The Ram loaded 10-yard trucks in less than 60 seconds each. Downtown streets were cleared overnight after a 2 day blizzard with 3 to 4 foot drifts which paralyzed traffic.

Ask your "PAYLOADER" Distributor—or write direct to us for literature

RAM EQUIPMENT CO., INC. 6203 West Broadway Minneapolis 27, Minnesota

"You're Right with a RAM"

★ ROTARY SNOW PLOWS
★ BLACKTOP SPREADERS
★ STREET SWEEPERS
★ LEAF MACHINES

Designed especially for the "PAYLOADER" Tractor. Sold by all "PAYLOADER" Tractor Distributors.

. . . for more details circle 299 on enclosed return postal card

TOMORROWS BULLDOZER–TODAY!

"THE BULLDOZER OF THE FUTURE" this is the way one Road Dept. official described the Eimco 105 when he saw it operate on competitive tractor tests. Here, once again, the Eimco 105 Dozer has demonstrated superiority over conventional type tractors. In job after job, the 105 consistently proves that its simplicity of operation, smooth power flow, visibility, maneuverability and reduction in operator fatigue is the difference between marginal production and profitable production.

The work site consisted of a steep incline with rock outcropping in big slabs. The bottom ends of the rocks were deeply embedded and required maximum tractor effort to remove them.

Bulldozing down the slopes, the torque converter drive of the 105 enabled it to pick up a capacity load and move down the slope ahead of the competitive tractors with their outmoded conventional type drives.

Throughout the test — straight bulldozing, removing rocks and maneuvering — the 105 managed everything that came its way and did it with the least amount of operator effort. In direct contrast, the competitive tractor operators were constantly clutching, changing gears and braking to accomplish their tasks.

Eimco's Unidrive constant mesh transmission gives variable speed independent track control without clutching and shifting. Let us demonstrate this tractor.

THE EIMCO CORPORATION

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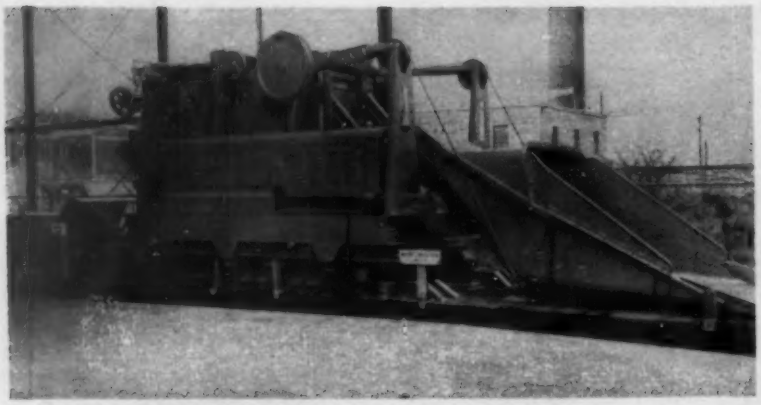

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New Worthington dual drum concrete pavers are being shipped to Shepard Air Force Base, Wichita Falls, Texas. The Paymasters were sold to Nolan Brothers, contractors, who are general contractors for the multi-million dollar expansion of base facilities.

The new pavers will be used to lay approximately 550,000 cu. yd. of concrete, the equivalent of 170 miles of paved highway. This concrete will be contained in the main runway, the alert apron, the operational apron, and all connecting taxiways and warm-up aprons, the pavement varying in depth from 19 up to 30 in.

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Predicted for Prestressed Concrete:

Very Long Spans, More Draping Strand Use

Prestressed Concrete Institute draws 700 delegates to Chicago meeting, where prestressed pavement and inspection of prestressed construction were also among the panel topics.

By Hubert C. Persons
Contributing Editor

BRIDGES with spans 2,000 ft. long may now be designed in prestressed concrete, a noted bridge engineer told members of the Prestressed Concrete Institute meeting in Chicago the week of September 21. The speaker was Luis Saenz of the Havana, Cuba, engineering firm of Saenz-Cancio-Martin. Mr. Saenz participated in a panel discussion on "Longer Span Prestressed Bridges," during the Institute's fourth annual meeting.

Highway pavement prestressing had a prominent place in the proceedings of the four-day meeting.

"Because of the magnitude of the highway program the use of prestressing in pavement can conceivably double the field of use of prestressed concrete," John J. Murray of Jones & Laughlin Steel Corporation, Pittsburgh, predicted. Mr. Murray, development engineer for his company, directed the construction and testing of an experimental prestressed pavement (Roads and Streets, August, 1957). Murray's paper, "Prestressed Highway Pavement's Future Potential," reviewed this research.

● *Participants* in the panel discussion of "Longer Span Prestressed Bridges," during which Mr. Saenz predicted 2,000 ft. spans, included a number of widely known bridge engineers. In addition to Mr. Saenz, panel members were: Noel Willis, bridge engineer, department of streets, Philadelphia; Andrew J. Brown, of Skidmore Owings and Merrill, Chicago; Felix Kulka, of T.Y. Lin & Associates, Los Angeles; and Russell Fries, construction engineer, DeLeuw, Cather & Brill, Chicago. Morris Schupack of Shupack & Zollman of New York, was moderator. Mr. Shupack told members of the Institute that lightweight aggregate concrete may be used in prestressed bridges before long.

A symposium on "Draping Strands at the Illinois Toll Road and Elsewhere," developed lively interest. M. E. Bender, of Knoerle, Graef, Bender & Associates, Inc., Baltimore consulting engineers, headed this panel. Mr. Bender was chief bridge engineer of the consulting firm during the construction of 224 prestressed concrete bridges on the Illinois Toll Highway. Members of the discussion panel were: Philip E. Balcomb of the American-Marietta Co., La Grange, Ill.; Charles H. Goodman, Material Service Corp., Chicago; William J. Talbot, Jr., chief engineer, Precast Concrete division, Ben C. Gerwick, Inc., San Francisco; A. H. Gustaferro, Consumers Company division, Vulcan Materials Co., Chicago and Jacob O. Whitlock, president, Midwest Prestressed Concrete Co., Rochelle, Ill. It was said that although deflecting strands increases cost, it is a mistake not to follow this procedure. Mr. Gustaferro said he believed the future will call for draped strands. Mr. Balcomb suggested that it should be up to the designer as to whether to adopt the draping strand method, but that it should be given good engineering scrutiny.

Another panel discussed "Interpretation of Specifications in Relation to Inspection." Jack R. Janney, Chicago consulting engineer who designed the test bridge which influenced the adoption of prestressing for the Illinois Toll Highway, was referee. Panel members were Ole Larson, materials engineer, Illinois division of highways; E. L. Erickson, chief of the bridge branch, U.S. Bureau of Public Roads; Al Parme, manager, structural and railways bureau, Portland Cement Association, Chicago; E. L. Peck, plant manager, Midwest Prestressed Concrete Co., Springfield, Ill.; and J. J. Waddell, chief materials engineer, Knoerle, Graef, Bender & Associates, Baltimore, Md.

Mr. Erickson spoke at some length on, "Just What is the Need for Specifications?" Buyers must be assured of a durable and safe product when it is used on any structure, Erickson said. "Engineers must have guides to control design and construction. Draped strands present only one of many questions. For one thing, sharp bends in strands should be avoided. Specifications do two important things," Erickson said. (1) Give designing engineers a basis for design. (2) Protect owners from faulty designs.

● "*The Bureau* of Public Roads was attracted to prestressing during the Korean war when steel was in short supply," Mr. Erickson said. "In an effort to relieve shortage of critical materials the Bureau set up rules for design and construction and published its Criteria for Prestressed Concrete Bridges." This work, he said, has been adopted for many building codes. "Inspection," Mr. Erickson said, "is a vital part of engineering construction. If prestressing is to continue to be successful, careful inspection must be maintained. There is a great deal we do not know about it and a great deal we must find out. The Bureau of Public Roads is interested in getting more and better information. We are cooperating on research projects with several state highway departments and with the University of Illinois, University of Florida and Lehigh."

The next annual convention of the Prestressed Concrete Institute is to be held in Miami Beach, Florida. Attendance was approximately 700 at the Chicago meeting. In con-

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junction with the meeting, 320 members visited the research and development laboratories of the Portland Cement Association at Skokie, Ill., especially to see the new fire test center. A caravan of seven chartered buses took the visitors on inspection trip over the northern section of the Tri-State Tollway.

Six-Yard Tractor Shovel Replaces Two Power Shovels

A case where an oversize, rubber-tired tractor shovel is doing the work of two former power shovels is reported by R. H. Wright and Son, quarry owners at Fort Lauderdale, Fla.

This company, which handles transit-mixed concrete, prestressed concrete work and road construction, claims that the machine has in fact replaced two 2½-yard power shovels on their work. The machine in question is a Michigan Model 375A tractor shovel with 6-yard bucket, powered by a 375-hp loader.

In their materials handling operations, the Wright operators heap a 14-cu. yd. truck body in two passes in less than two minutes. In one 11-hour day, the machine loaded 6,000 cubic yards into the company's trucks.

Soil Stabilization

SOIL STABILIZATION STUDIES 1957. Bulletin 183, $1.00 per copy. Highway Research Board, 2101 Constitution Ave., Washington, D.C.

Five papers from the Board's 36th Annual Meeting:

(1) By J. W. Reppel; describes the results obtained with "Salt Stabilization on Ohio's Secondary System," especially the low-traffic farm-to-market roads.

(2) By R. K. Viskochil, R. L. Handy and D. T. Davidson; describes the methods and results of a study on "Effect of Density on Strength of Lime-Flyash Stabilized Soil."

(3) By Eugene A. Miller and George F. Sowers; on studies on "The Strength Characteristics of Soil-Aggregate Mixtures."

(4) By Raymond F. Dawson and Chester McDowell: gives results of use of dust from "Expanded Shale as an Admixture in Lime Stabilization."

(5) By T. William Lambe and Zu-Cheih Moh: discusses the "Improvement of Strength of Soil-Cement with Additives," including dispersants, synthetic resins, waterproofing agents and several salts and alkalis.

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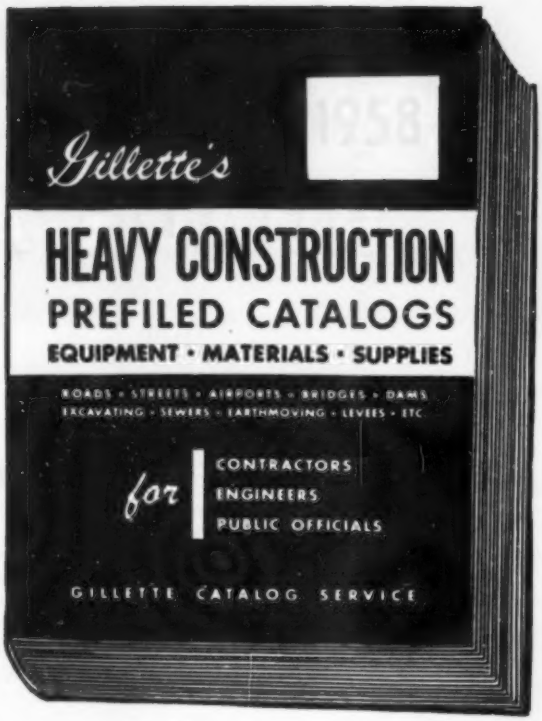

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Carey Manufacturing Company, The Philip
Chrysler Corporation, Industrial Engine Div.
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Cleaver-Brooks Company
Cleveland Form Grader Co., The
Cleveland Trencher Co., The
Colorado Fuel & Iron Corp., The
Continental Motors Corporation
Cummer & Son Co., The F. D.

Detroit Diesel Engine Div.

Erie Strayer Company

Flexible Road Joint Co., The

Gar-Bro Manufacturing Co.
General Motors Corp.
Gledhill Road Machinery Company, The

Harnischfeger Corporation
Heltzel Steel Form & Iron Co., The
Huber-Warco Company, The

Jackson Vibrators, Inc.
Joy Manufacturing Company

Miller-Tilt-Top Trailer Company
Minneapolis-Moline Company

Naugatuck Chemical Div.

Onan & Sons, Inc., D. W.
Owen Bucket Company, The

Phoenix Products Company
Pioneer Engineering
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Republic Steel Corporation
Rogers Brothers Corporation
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Seaman-Andwall Corporation
Seaman-Gunnison Corporation
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United States Rubber Company
United States Steel Corp.
Universal Form Clamp Company

Waukesha Motor Company
Williams Form Engineering Corp.

New Contender for Chicago Area Mix Tonnage

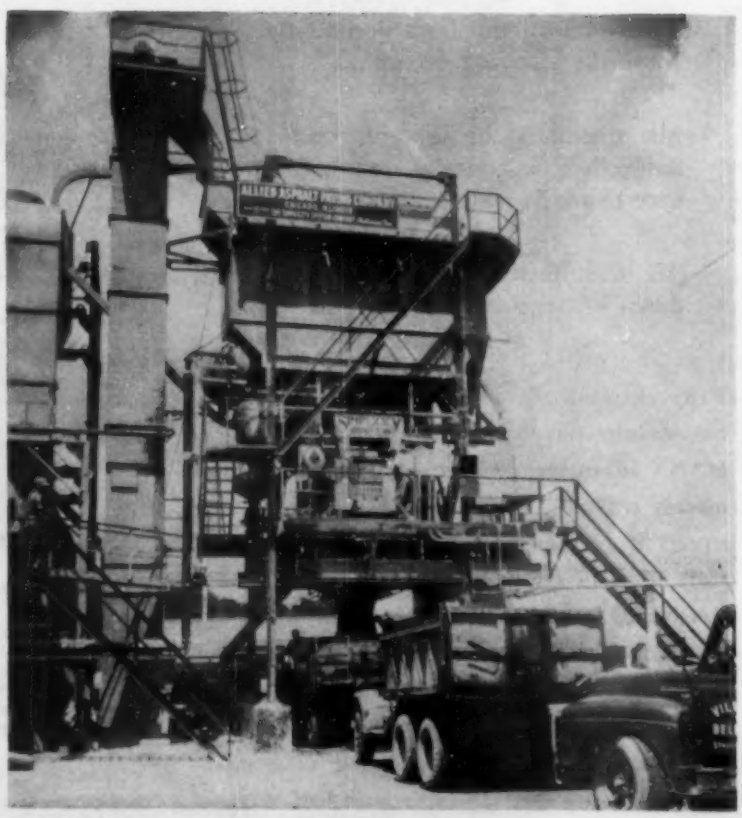
Big-Capacity Automatic Asphalt Plant

Planned to serve owner's own paving, other contractors and suburban municipalities, 250 tons-per-hour plant is designed for low operating cost and close quality control.

IN LINE with a trend in the Chicago metropolitan area, a multiple-customer asphalt plant combining large capacity with low labor cost and many efficiency features, began operation recently at suburban Hillside, Illinois.

The plant, which is Simplicity engineered to the owner's requirements, is Allied Asphalt Paving Company's bid for a full share of the large and growing asphalt mix tonnage of the area. Allied has two asphalt plants, this one having replaced an older plant of about half the tonnage capacity. Following are some of the features of this plant, which requires only two men for its 250 tons-per-hour output.

● *Location.* Acquisition of the new plant was precipitated by having to move the old one to make way for a cloverleaf into Congress Street Expressway. The new plant, not far from the old one, is situ-



● A Batch truck receives a load as others wait in line.

● The crane works along a straight-line shuttle to charge bins.

● The plant operator has all the automatic controls within easy reach on his platform.

ated in a yard layout which is served only by truck. An economy advantage inherent in the location is the fact that the tanks and shop of a principal asphalt supply source, Seneca Oil Company, lie immediately alongside.

The plant's location is within strategic hauling distance of much of the metropolitan region, and is particularly accessible to the booming south and west sides.

Another advantage is the proximity of Allied's aggregate source. Consumers Company's plant and quarry are only ½ mile away on an economical trucking shuttle.

The plant facilities are described and discussed in the order of material flow:

1. *Stockpiles* in the rear occupy six areas assigned to various sizes or specification grades of stone, chips and sand. A single Bucyrus-Erie 22-B crane with 1-yd clamshell bucket charges all material into bins.

2. *Raw Material Flow.* Six 100-ton capacity Butler bins receive aggregates, with two or more working on any given job delivery. These bins, set in a straight row, straddle a 24″x256′ Barber-Greene belt conveyor. Proportioned material flows from each bin onto the belt via a Jeffery feeder.

This arrangement was selected in lieu of stockpile tunnels for a number of reasons. Tunnels would be more costly and troublesome to move. Allied officials thought, in the advent that a change of company operations would necessitate a new plant setup. The owners feel that the aggregate reaches the dryer in cleaner condition above ground. And the facility might be more accessible should trouble develop in the conveyor system.

As a safety feature, the conveyor has an "airplane switch," i.e., a pull cable extending the full length of the conveyor. A pull on this cable at any point will immediately halt the belt.

3. *Dryer.* From the belt, material goes via 16-in. bucket elevator cold feed to the dryer. The dryer is a 10′x20′ double-shell unit which in Allied's opinion offers considerable operating advantage. With the double drum shell, left-over material at day's end need not be cleaned out and wasted if the same, or similar specification material is to be processed the next day. In any event, the quantity is too small to seriously affect the first morning load. While the dryer is heating up, the left-over material is recirculated through the outer drum and the cold elevator. When the proper temperature is reached, the conveyor belt is started, and the inner drum begins to take aggregates.

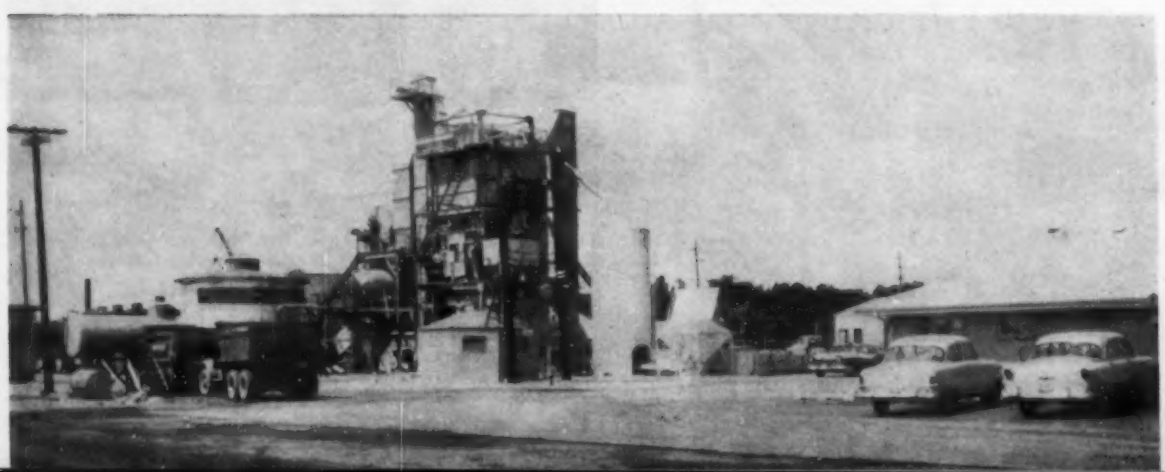
The dryer, cold elevator and feeders are powered by a 100hp. electric motor with a Falk No. 7-GHC speed reducer direct-connected by a flexible coupling.

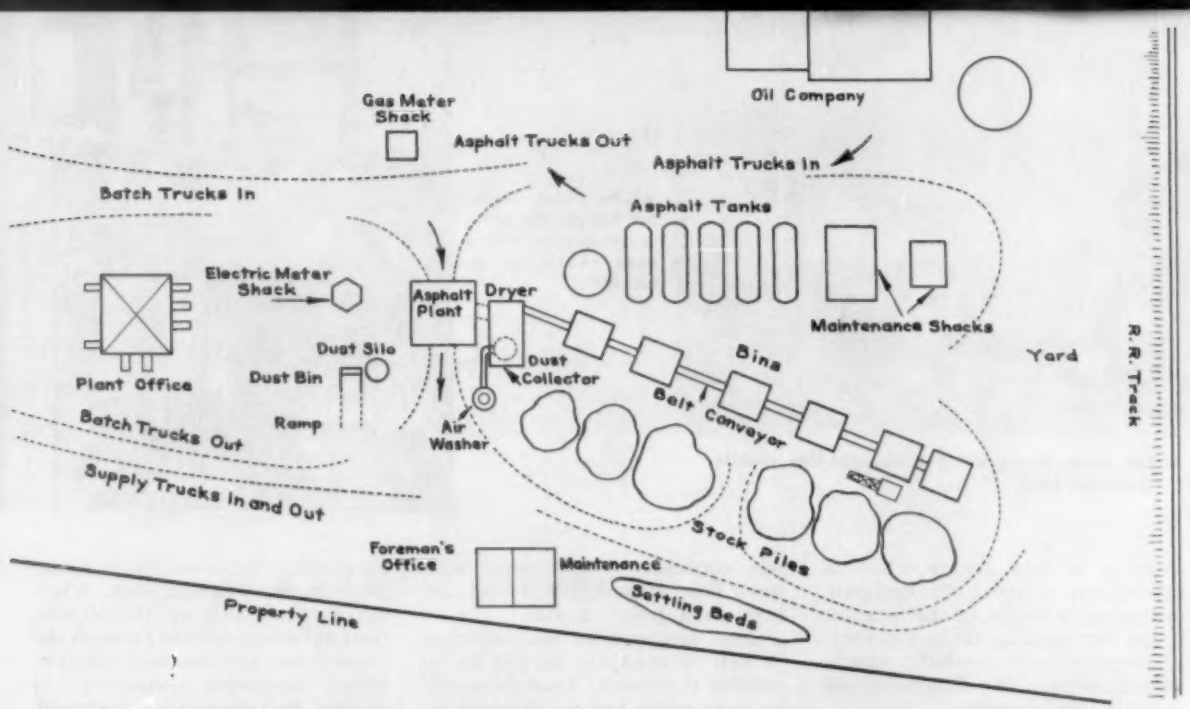
The dryer is heated by a General Combustion Company combination gas or oil burner. The system burns gas during the summer months and fuel oil from October to May under agreement with the utility company.

4. *Hot Materials.* From the dryer, material passes via another 16-in. bucket line to a Nordberg-Symons 5′x14′, 2½-deck vibrating screen. This screen drops ¼-in., ½-in. and ¾-in. stone and sand into the four compartments of an 85-ton hot bin.

The operator contacts the office by his private telephone to find out the type and tonnage of mix desired. After determining the components, he sets pointers on a 10-

● The Allied plant offers a broad and easy approach for trucks. The plant office is at right.





● Flow of trucks and of material can be visualized in this diagram of Allied's yard layout.

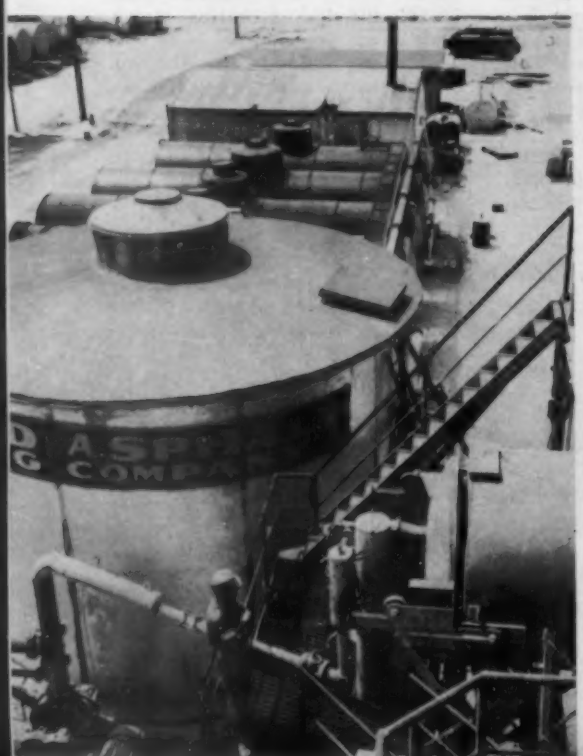
000-lb. Hardymatic scale, one pointer each at the designated weight required for sand, gravel and lime dust.

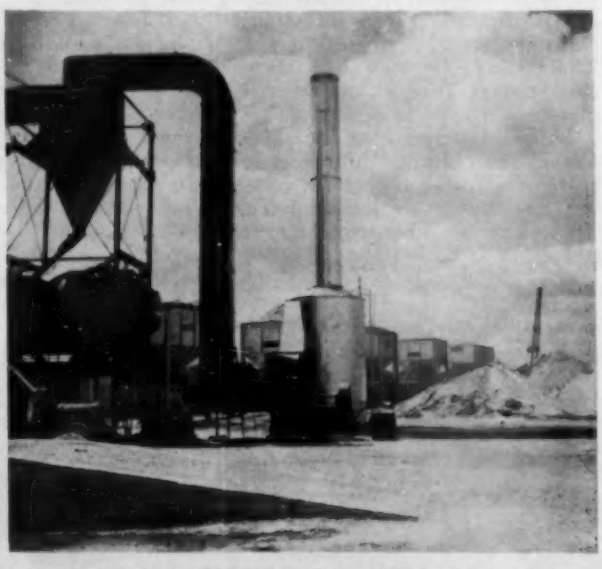
5. *Asphalt Feed.* The specified grade of asphalt is pumped up from storage by a 4-in. pump to a surge tank equipped with steam coils and 3-in. steam-jacketed dump cock, and thence to a steam-jacketed weigh hopper with a 6-in. cylinder operated dump cock. The asphalt is weighed on a 1,000-lb. Hardymatic asphalt scale, then pumped out by a No. 8-4-8 Kinney asphalt pump to the spray bar. The bar is placed perpendicular to the line of the two mixer shafts, as opposed to the more conventional parallel alignment.

5. *Asphalt Mixing.* The mixer is a steam-jacketed pugmill of 8,000-lb. capacity. The material is dry-batched for 15 seconds and wet batched for 40 seconds or whatever time is specified, then discharged into trucks. The mixer is driven by a 150 hp G.E. ball bearing motor with a Falk speed reducer and coupling, sprocket reducer, and chain drive to the mixer.

6. *Automatic Operation.* The weighing, batching and mixing of hot materials are fully automatic. Further, the operator, after designating proper quantities on his

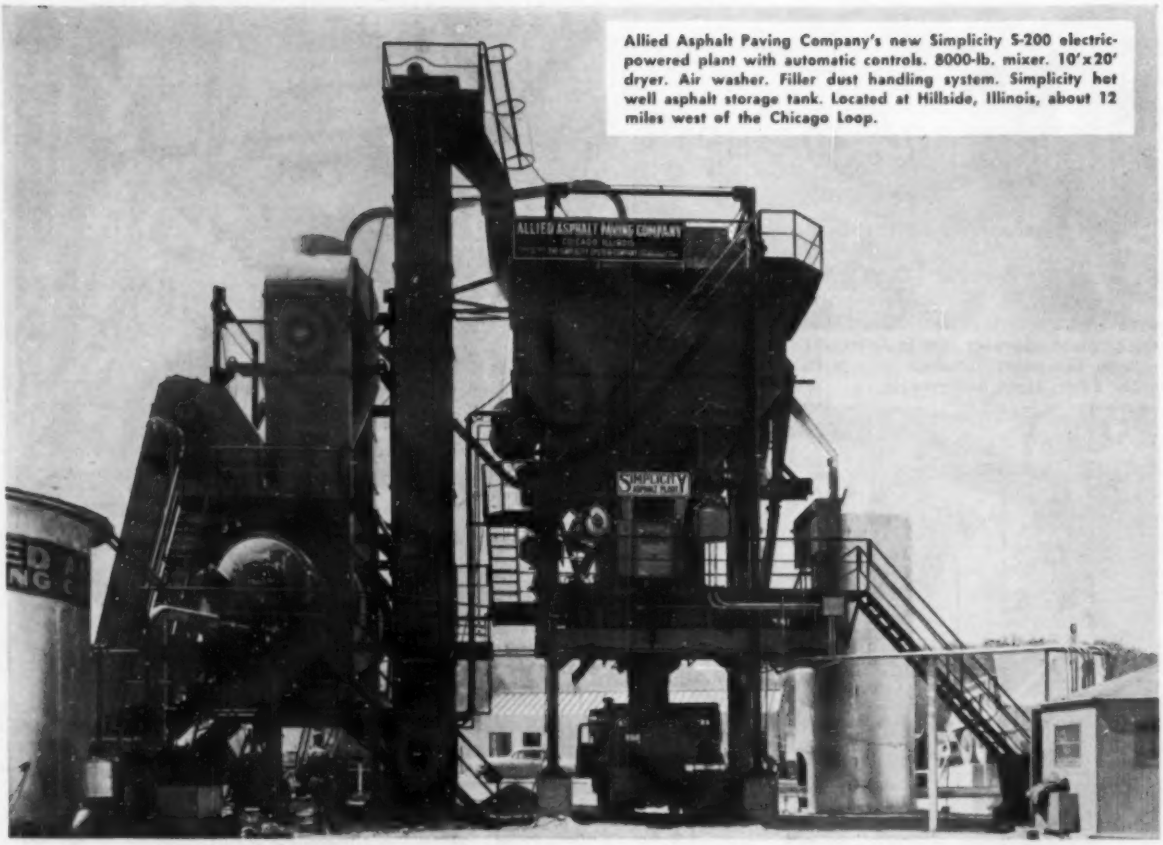
(Continued on page 138)





● The dust collector is at upper left, with pipe leading down to the air washer. In the foreground is the truck ramp leading to the lime bin.

● The fireman at his post on the dryer platform, with Allied's asphalt tanks in the background.



Allied Asphalt Paving Company's new Simplicity S-200 electric-powered plant with automatic controls. 8000-lb. mixer. 10'x20' dryer. Air washer. Filler dust handling system. Simplicity hot well asphalt storage tank. Located at Hillside, Illinois, about 12 miles west of the Chicago Loop.

QUICK AS A CAT

QUIET AS A MOUSE

CLEAN AS A PIN

After operating a Simplicity S-75 plant for ten years Allied required greater capacity, quick changes in asphalt mixtures and quiet and clean operation. After comparing several makes of plants they decided Simplicity S-200 was the complete answer because:

With automatic weighing and batching of four tons per batch it is—QUICK AS A CAT!

With quiet roller chains, totally enclosed motors and reducers, bigger but slower moving dryer, elevators and mixer, and vibrationless tubular columns it is—QUIET AS A MOUSE!

With dust housings, fugitive dust system and the universally used Simplicity Air Washer it is—CLEAN AS A PIN!

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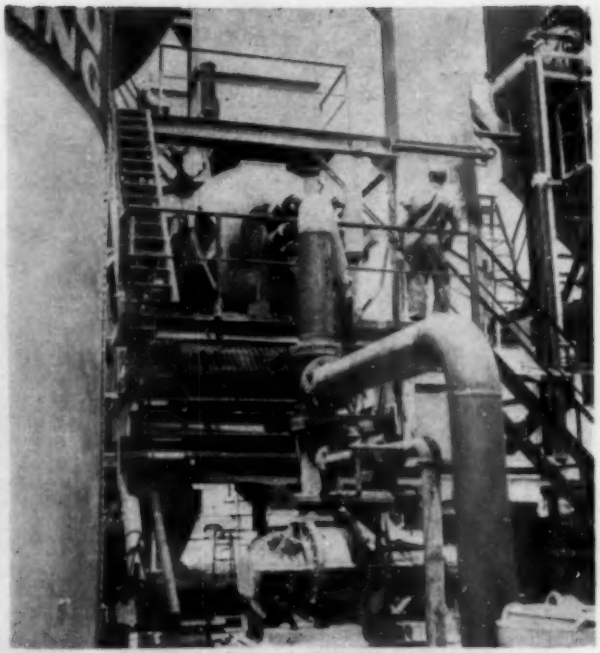
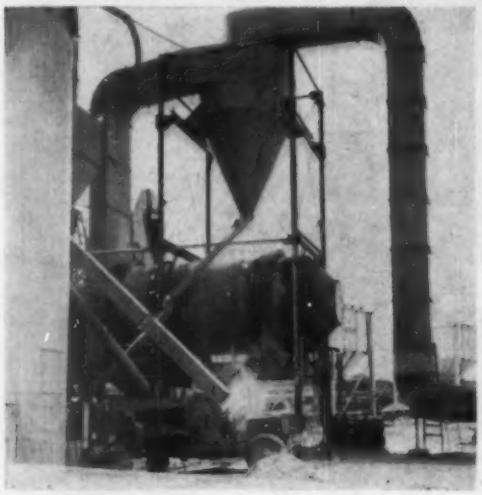
● The plant operator gets instructions from the superintendent who is in the office, right background.



● Another view of the dryer platform showing the fuel line and pump.



● The double shell dryer, with lime dust silo and fines chute in foreground.

(Continued from page 136)

scales, can set dials to handle three full batches, then turn a dial marked "re-set" and the cycle is repeated.

The operator can alternate between two mixes or bring in a third. On a day when both surface and binder mixes are needed, he begins by pre-setting the weights for the components of each, with two automatic "bands" in the control box representing the two mixes. With the proper weights thus designated in advance, the operator merely turns the selector switch for the particular "band," thus activating the batching and mixing for that batch. When that truck has departed and the next in place is to receive the other mix, he turns the switch for the other "band," setting in motion the batching of that mix, the proper amount of its components already having been predetermined.

If a truck desiring a third mix should appear, the operator, while another truck is still loading, turns to the "band" not in use at the moment and resets it with the component weights for this third mix.

Another alternative: the operator can prepare "manually" any batch by weighing each component by an individual dial. This practice is confined, as a rule, to less-than-batch loads.

7. *Asphalt Storage.* Allied carries four grades of asphalt: 60-70 penetration, 70-85, 85-100, and MC3 cutback asphalt. These are contained in three 10,000-gal. tanks and one 40,000, with another 10,000 gal. tank containing the plant's fuel oil.

The large tank is of a special Simplicity design. It has a small "inner" tank with its own system of heating coils, thus facilitating the heating of smaller quantities of asphalt.

A Hy-Way heater, which can burn both oil and gas, heats the circulating oil which is then pumped through the tanks by a 7½ hp pump. Heating oil is carried in a 3 in. pipe enclosed in a 4 in. pipe. Valve controls at each tank regulate the heating oil flow through the tank so as to maintain the asphalt at the required temperature.

8. *Dust Control.* A 9 ft. diameter cyclone type dust collector, made by Simplicity, picks up dust from the dryer. This air is then drawn through a conduit by a Clarage fan to a 10-ft. air washer where it is given a light spray under 100-lb. pressure at 93 gal. per minute. Sludge is pumped to nearby settling beds by a 7½ hp Fairbanks-Morse pump.

9. *Miscellaneous.* The trucks delivering lime dust for the mineral filler back up on their own dumping ramp. The dust is taken from the receiving bin by a screw conveyor to the mixer, or is sent by a butterfly valve to the dust silo.

The entire plant is powered by electricity, with motors by General Electric. Incoming lines are routed through a meter house. Electricity consumption for the period April 28 to June 2 was 313.6 kilowatts, which figure proved to be higher than average as the plant was used more in the "dry run" testing period than under normal operating conditions.

Simplicity System representatives set up the plant, bins and conveyor belt, all units being carried on concrete footings. The layout and overall design of the plant area, was planned by Allied.

The plant office is a 4-room air-conditioned structure housing the offices of Vice President Donald McLean and the plant operations and bookkeeping departments.

For Better Asphaltic Pavements –

Hot Mix Research Program Announced

Five-year national program adopted by the National Bituminous Concrete Association at its midyear meeting.

A nationwide program of research toward even better quality and control in the construction of bituminous concrete pavement was adopted by NBCA at the Association's Midyear meeting in Land O'Lakes, Wisc.

Over a hundred delegates and their wives attended the three-day meeting held in beautiful, serene King's Gateway Inn right in the heart of the lake country.

The much-heralded research program was set up for a minimum five year period. The general plan is that the work will be broken up into a number of different projects over the country—all coordinated by the National office to avoid duplication of effort. These individual projects will be sponsored by local State Associations either alone or in cooperation with the State Highway Departments and other agencies in that area.

● The program will include long range research projects as well as the study and dissemination of information on current considerations of both a technical and practical nature. For example, one of the early projects of a practical nature will be the instigation of a literature survey and the resulting classification of pertinent information so that the *facts* now available to the industry can be more readily assimilated and utilized. Overall scope of the program is intended to embrace every phase of high type bituminous concrete construction that might even remotely influence the quality of the finished pavement.

In order to include essentially all of the steps and factors which go into building high quality flexible type pavements, three points were added to the original Seven-Point program which was developed at NBCA's third annual convention in Las Vegas last February. The three additional phases of the program will cover Bases, General Workmanship, and Related Construction Practices and Materials.

The complete Ten-Point Program now reads as follows:

1) Producing, Stockpiling and Feeding of the Aggregate to the Plant.
2) Drying.
3) Methods of Screening, Storing and Proportioning in the Plant.
4) Production of the Bituminous Mixture.
5) Transporting Mix to Paver.
6) Laydown Procedure, Including Rolling.
7) Quality of Aggregate, Cement and Composite Mix.
8) Bases.
9) General Workmanship.
10) Related Construction Practices and Materials.

One of the chief objectives of the new program is to satisfy the need for improved communications so that research findings and the best thinking and "know-how" of our State Highway Departments, Federal Agencies, Suppliers' Associations, Contractors and Engineers can be *uniformly* reduced to practice to the benefit of the entire industry. Since a failure in any area adversely affects the status and competitive position of bituminous concrete across the country, the *uniform* application and enforcement of realistic specifications is important to every business man in the industry. Of equal importance is the proper selection and use of satisfactory materials and the utilization of good construction practice in all states. We in the bituminous paving industry have a vital stake in building even better roads so that the future maintenance load can be held to a minimum, leaving funds for the ever increasing demand for new construction in the years ahead.

Delegates also took action raising NBCA dues $75 for both regular and associate members. This action was in recognition of the necessary expansion of NBCA services, including of course the research program. But additional services in the fields of statistics, employee relations, reporting, advertising and public relations must be stepped up in order to fill the demand for data and information which emanates from all over the country.

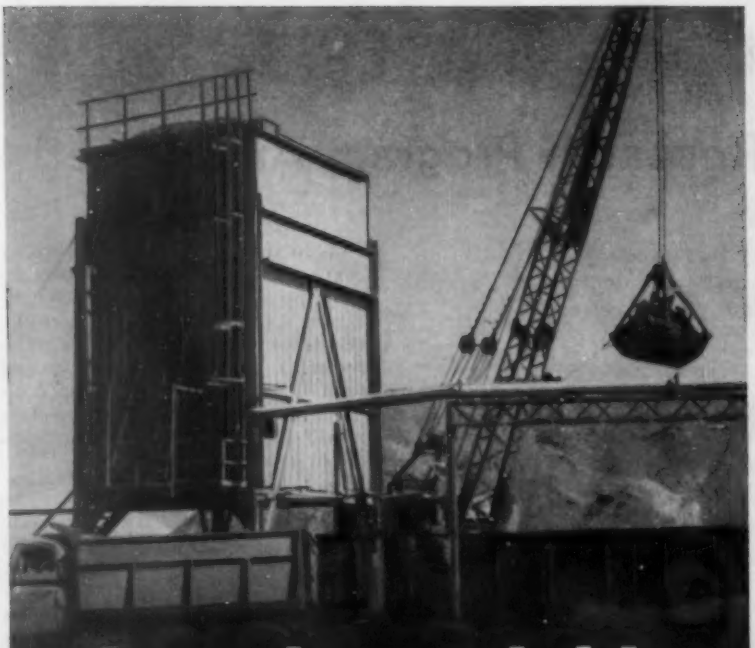
● Plans were also laid for an intensive membership drive to provide additional operating funds. To stimulate local level promotions, three incentive awards were authorized—a $100 cash award and an engraved plaque to the executive secretary of the State Association registering the most new members, an engraved plaque to the NBCA governor having the most applications in his state, and an engraved plaque to the NBCA regional vice president with the most new members in his particular region.

● There were 13 state asphalt paving association secretaries present at Land O'Lakes for the secretaries' group meetings and the joint meetings with the NBCA officers, directors and board of governors. Matters considered by the secretaries included discussions on what manner and to what extent the various states would participate in the nationwide research program of the National Association. The secretaries also exchanged views on other problems including publicity and public relations in their respective areas. Scott Baker, chairman of the State Secretaries' Group, presided at the meeting.

Conference on Soils

Report on the soil conference sponsored by ASTM Committee D-18 on Soils for Engineering Purposes, and Sociedad Mexicana de Mecanica de Suelos, A.C.; December, 1957, University of Mexico in Mexico City is published in English and Spanish. Price $9.00. Obtainable from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

Included are discussions on Sampling Equipment and Consolidation, Compaction and Compaction Control, and Soil Strength.



when dependable heat is a must

. . . count on Cleaver-Brooks Peak Temp for automatic high-temperature, low-pressure heating — without water or steam problems . . . for asphalt terminals, prestressed concrete, bulk storage plants and other process operations

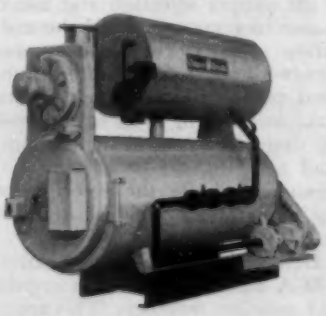
Never a delay in delivery for the asphalt contractor or supplier who depends on Peak Temp.

The new Peak Temp *forced-circulation* oil heater does away with costly, high-pressure steam lines, valves, boilers. Heated high-flashpoint oils circulate, raise and maintain bitumins and heavy viscous materials to application temperatures — at a much faster rate than steam.

- **FORCED CIRCULATION** provides uniform heat distribution. No carbon build-up or coking.
- **COMPLETELY AUTOMATIC** — fully equipped with advanced operating and safety controls. Quiet, smokeless. Completely fiber-glass insulated and metal-jacketed.
- **OPERATES AT ATMOSPHERIC PRESSURE** — minimum attention and maintenance.
- **NO REFRACTORY** in furnace to replace or maintain. No stack.
- **CIRCULATING OIL LASTS INDEFINITELY**—won't freeze in spring and fall operation.
- **HEATS OIL TO 450° F.** without special pumps and fittings.
- **RUGGED**, all-welded construction.

Versatile — easily adapted to heating a variety of viscous materials — such as plastics, residuals. Highly effective for quick drying of forms used with cast, prestressed concrete and structural members.

For full information write Cleaver-Brooks Company, Dept. M, 395 E. Keefe Ave., Milwaukee 12, Wis.



Cleaver Brooks®

ORIGINATOR AND LARGEST PRODUCER OF PACKAGED BOILERS

. . . for more details circle 257 on enclosed return postal card

AED'S New Rental Rates Reflect Higher Costs

An increase in rental charges for most items of construction equipment is reflected in the 1958 "Compilation of Rental Rates for Construction Equipment," published this month by the Associated Equipment Distributors. AED is the national trade association of construction equipment distributors and manufacturers.

Reporting on national-average rates for 2,000 items of equipment, the new Tenth Edition "Green Book' was compiled from a survey of AED's distributor-members. The Association emphasizes that the figures are purely national averages.

The increases for various items recommended, show the following changes compared with the 1957 edition of the Rental Book:

Portable compressors, up 2.5% (diesels no change); lifting cranes up 5.5% for crawlers and 4.5% for diesel truck-mounted, with less rise for smaller gasoline models; clamshell cranes up 5% for crawlers, 4% for truck-mounted, 6.7% for diesel truck-mounted alone. Draglines up 6.2% to 6.8% except for gasoline truck-mounted units, with less rise.

Power shovel rates rose 6% for crawlers and 3% for truck-mounted; pull shovels up 6.5 to 7% except for truck-mounted, which again saw less rise.

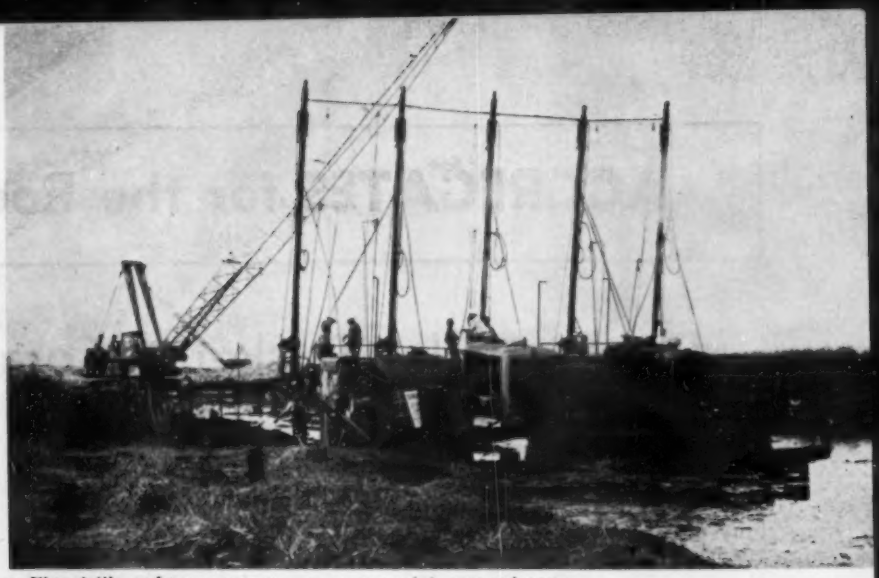
Pile hammers rose 10% for drop type, 4% for steam or electric, 2% for gasoline powered.

Scraper rental rates changed little, with some increases, some decreases, ranging to 7% down and 4% up. Tractor rental rates gained an average of 1.5%, with higher rises for smaller or wheel tractors.

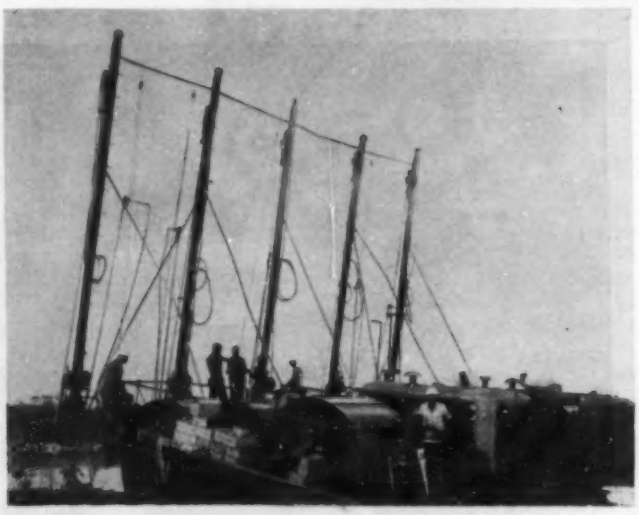
Freeway Service Area

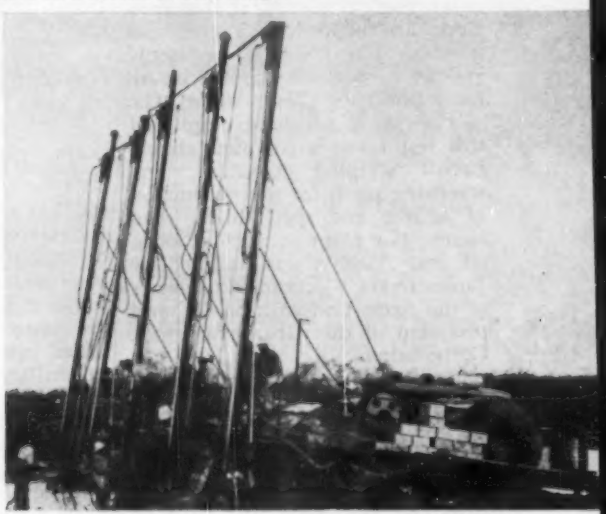
Efforts are being made to stop the Maryland State Roads Commission from establishing a service area along the Baltimore-Washington Expressway. The commission has made application to the Ann Arundel County Zoning Board to rezone the area in question from farm to "heavy commercial" and as yet the board has not rendered a decision. The commission may proceed with a plan to ask for a court ruling. Opponent groups say that the food, fuel and lodging needs of motorists can be served easily by nearby merchants over existing connecting roads if adequate signs and markings were erected.

Job and Equipment Ideas



● Five drills and two compressors on a special swamp buggy.





Special "Drill Buggy" For Swamp Conditions

Builders of roads, canals and other swamp area projects will be interested in the equipment pictured. It was devised by Clemens Construction Company for an 11-mile canal to be constructed through the muck of Florida's Everglades. A special drilling rig had to be built. This "drill buggy" was constructed in the firm's shops near West Palm Beach, Florida. Seven hollow steel wheels, 5 ft. in width and 7 ft. in diameter, support a platform which mounts five Ingersoll-Rand rock drills and two I-R Gyro-Flo 600 cfm rotary air compressors. It is maneuvered by two Ingersoll-Rand air motors geared to two of the wheels.

The canal, part of a Florida flood control project, is in a remote section of the swamp where the only practical surface travel is by air boat or outboard skiff. Drilling is not easy; bits must pass through several feet of muck before they reach the limestone formations below. During the rainy season the muck is covered by several feet of water, limestone presents difficulties too, because it is interbedded with loose shell, marl and sandstone. Hole cleaning becomes the most aggravating problem because loose rock tends to fall into the hole.

Despite the difficulties, the I-R outfitted unit has set quite a mark for itself. It has been working, either full time or intermittently, since March, 1956. The equipment put down an average of 200 18-ft. holes per working day, or 3,600 ft. of hole for each 10-hour period. Due to the rig's great portability and the high efficiency of its drills and air equipment, this figure is more than twice the output of a drill barge which was used in the same area. Specific information on the project: holes are drilled to 16-ft. minimum and 20-ft. maximum depth. Spacing is in a 9 x 9-ft.-square pattern, five holes wide. Drill steels used are approximately 24 ft. long and have lugged shanks; bits are 3¼-in. type. The drills are Ingersoll-Rand's X-71WD units with modifications for the special conditions found in Florida. Photos were taken in December, 1957.

Encircling Work Platforms Aid Pier Finishing

Labor and time were saved on a bridge project by use of working platforms which could be suspended at any level desired by good adjustment. The structure is the Harbor Bridge at Bridgeport, Connecticut, for the turnpike recently completed. The contractor, A. S. Wikstrom, Inc., provided safety and efficiency for workers here by using "Gold Medal" Junior Swinging Scaffolds, hung from $\frac{5}{16}$-in. galvanized steel cable, suspended from cross ties over the pier beams.

AGGREGATES for the Road Program

Plant for Clay Pocketed Coral and Limestone

SOME OF the best rock men in the southeast have tried unsuccessfully in the past to overcome the mineral mining challenge presented at Lee County, Georgia, where underground caves of coral and limestone are bedded with clay and gumbo. The difficulty reportedly yielded to methods adopted by Albany Limerock Corp., Albany, Ga.

The plant which accomplished this result was a complete closed-circuit scalping, crushing, and screening plant for the production of aglime and specification road stone. The plant equipment located near Albany, was installed by James Dykes, Cochran, Ga., owner of the Acme Construction Co. and president of the Albany Limerock Corporation.

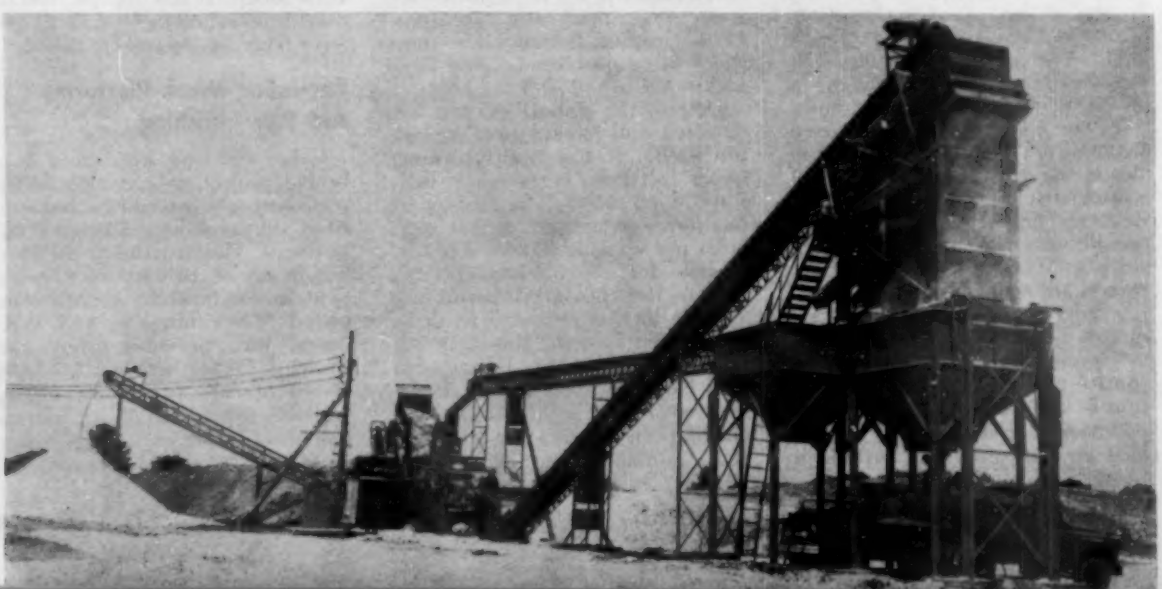
Major components of the plant as described for a recent season's operation, are a portable Universal 3645 Impact Master Fed by a 9-in.-pitch, 16-bar, 36-in.-width Universal Wobbler Feeder. Both crusher and feeder are mounted on a steel truck frame with three axles.

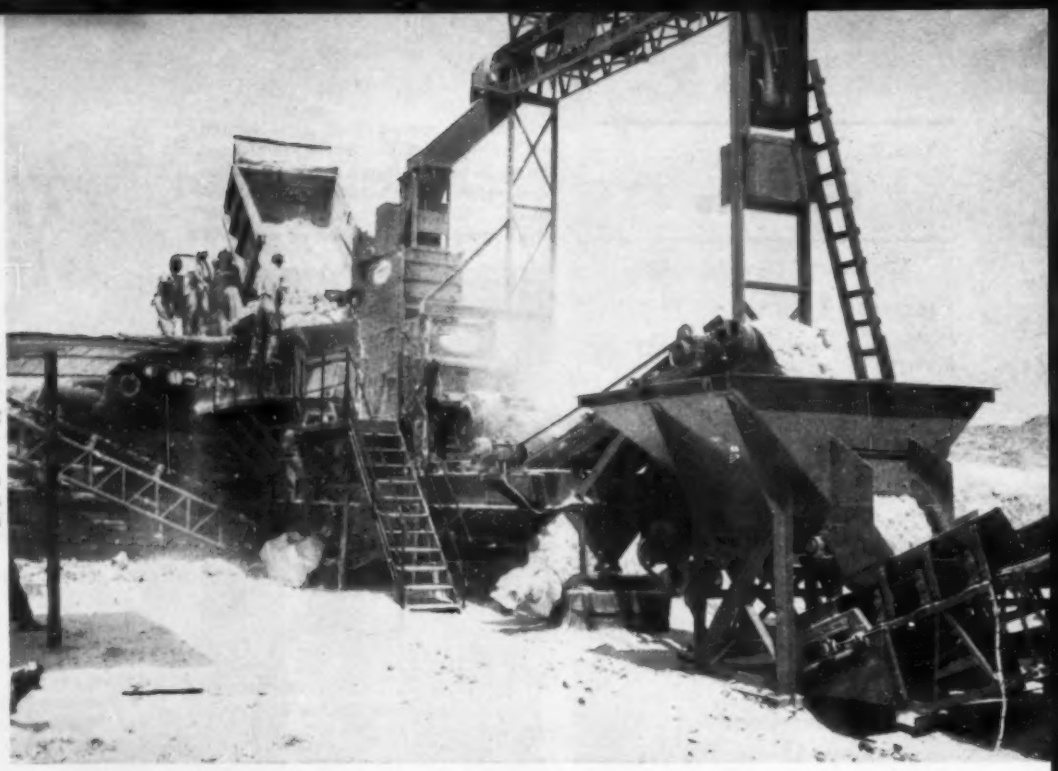
For profitable operation it was found it would be necessary to do heavy scalping ahead of the crushing to eliminate clay in the finished material. The natural material contains 6 to 8 percent moisture and its gummy characteristics presented severe pre-crushing separation problems. Economic factors also made necessary the salvaging of as much separated material as possible.

The Universal Wobbler Feeder, ahead of the Impact Master, solves

● Quarried coral limestone bedded with clay is carried to this 9-in.-pitch Wobbler Feder Ribs on Wobbler bars restrict maximum size of material passing through the bars to 3 x 6 in.

● Over-all view of Albany Limerock Corporation's closed-circuit, scalping, crushing and screening installation.





● Close-up view of the portable 3645 Impact Master in the closed-circuit scalping, crushing and screening installation. In dry rock, production of the plant is rated at 150 tons per hour.

the problem through a reversible reject-conveyor installed under the feeder. The feeder also eliminated the need for a washer in the quarry set-up. The Wobbler Feeder is a combination feeder-scalper. While the load is in motion, fine material 3 in. and under is worked loose from oversize and passes through openings between the Wobbler bars. The bars, oval in cross-section, are positioned alternately vertical and horizontal at angles of 90 degrees to each other. Timed to maintain their same relative positions as the bars rotate, the Wobbler Feeder imparts a rocking, tumbling motion to the load.

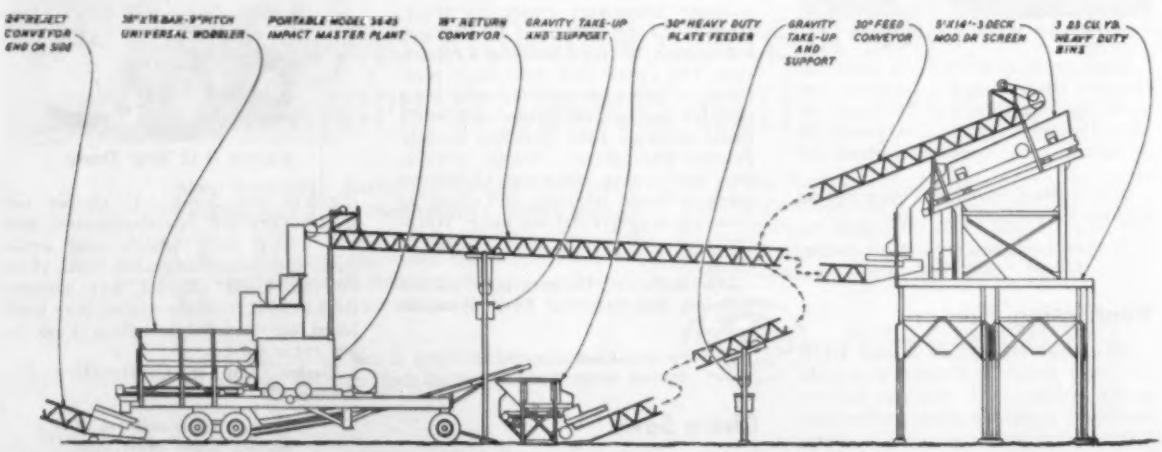
The coral limestone is quarried by drilling 18-ft. holes in the limerock with a wagon drill powered by a Chicago Pneumatic compressor and blasting with 40 percent dynamite. The material is then loaded into Ford 6-yd. dump trucks with a Caterpillar Traxcavator, hauled to the plant and dumped into the feeder.

Ten percent of the feed material passes through 3-in. openings between the Wobbler bars. If the material is clean, the separated fines are added to the crushed material from the Impact Master and all the material conveyed to a screening tower.

If the material received by the feeder is dirty, a reversible reject-conveyor carries it off to the side for stockpiling.

The feeder operates on a 15 hp high-torque electric motor at 1800 rpm; the Impact Master on a 200 hp motor at 1200 rpm. A Lovejoy 3-to-1 variable-speed drive on the feeder enables the operator to pace the feed flow of material into the crusher unit.

Crushed material reaches the screening tower by conveyor and passes over a speed-adjustable, 3-deck, 5′ x 14′ Simplicity screen with self-feeding oilers. The material passing the screen is stored in three 23-yd. bins. Screen oversize is returned to the crushing unit for further reduction.


24" REJECT CONVEYOR END OR SIDE
30" x 16 BAR-9" PITCH UNIVERSAL WOBBLER
PORTABLE MODEL 3645 IMPACT MASTER PLANT
18" RETURN CONVEYOR
GRAVITY TAKE-UP AND SUPPORT
30" HEAVY DUTY PLATE FEEDER
GRAVITY TAKE-UP AND SUPPORT
30" FEED CONVEYOR
5' X 14' - 3 DECK MOD. DA SCREEN
3 - 23 CU. YD. HEAVY DUTY BINS

● Universal Impact Master semi-portable crushing and screening plant, as erected at Albany, Georgia.

New Products

(Continued from page 122)

Prestress Tubing

Pliable steel tubing for forming ducts in prestressed concrete, and installing service ducts in concrete and concrete piles has been announced by Kopex.

The new tubing can be shipped in drum form, permitting greater ease in handling and storing and, according to the manufacturer, because of the long lengths, it offers greater economical handling on the job.

Kopex Division, Gemmer Manufacturing Co., 6400 Mt. Elliot Ave., Detroit, Mich.

For more details circle 137 on Enclosed Return Postal Card.

Backhoe and Loader

The new Ottawa Model LX backhoe, which digs to a depth of 12½ ft in any position of a continuous 190° arc of swing, and the Ottawa front end loader, are now available for the Oliver line of industrial tractors. Adaptations have been made for Oliver tractors, Models 550, 770, 880, Super 55, 77 and 88.

Ottawa Model LX Backhoe

Engineered as companion tools, the Ottawa "Big Muscle" backhoe and loader operate from one hydraulic system. However, either attachment can be mounted and operated without the other.

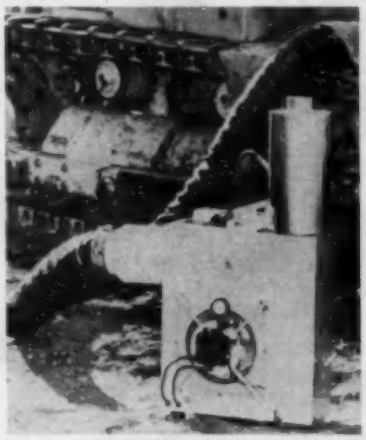
Ottawa Steel Division, Young Spring & Wire Corp., Ottawa, Kans.

For more details circle 138 on Enclosed Return Postal Card.

Ventilating Heater

The new "MoPeCo" Model GHE ventilator heater is claimed to significantly reduce cold weather heating problems, especially those concerning frozen and sluggish construction equipment.

The 110-lb unit is a portable heater delivering 1,200 cu ft of fresh, heated air through flexible, spring-reinforced ducts. A blower forces the hot air onto equipment engines, transmissions, personnel enclosures, and other parts which need to be warmed or repaired.

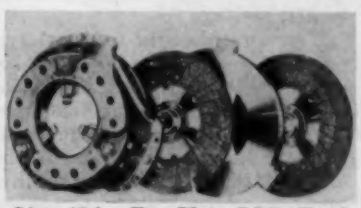


Ventilating Heater

All products of combustion pass harmlessly into the atmosphere. Hot air from the heater is safe, breathable air, and may be used to ventilate as well as heat sheds, tool shacks, field offices, tents, and maintenance huts.

Morrison-Pelsue Co., 2256 South Delaware St., Denver 23, Colo.

For more details circle 139 on Enclosed Return Postal Card.



Lipe 12-in. Two-Plate DPB Clutch

Heavy-Duty Clutch

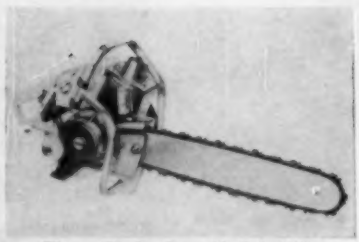
A new 12-in. two-plate DPB direct pressure heavy-duty clutch for truck, tractor, bus and industrial use has been announced by Lipe-Rollway Corporation. The 2-plate unit, with single plate cover, is claimed to possess higher burst strength and greater torque with lower pedal pressure than previous models. Friction-free internal linkage permits top mechanical efficiency — hysteresis curve of clutch releasing and engaging pressures is essentially the same. Warpage resistance and perfect alignment are featured.

Lipe-Rollway Corporation, Clutch Division, 806 Emerson Ave., Syracuse 1, N. Y.

For more details circle 140 on Enclosed Return Postal Card.

Chain Saws

Exclusive "gyro-balance", functional non-snagging styling, stepped-up horsepower and low cost are features claimed for two new "Titan" direct-drive chain saws, Series 4800 and 4900, introduced by Propulsion Engine Corp. The new 4900 series is equipped with an all-position, fuel pump carburetor, right hand starter, safety throttle lock, and guide bar length up to 30 in. The 4800 series has an anti-flooding, multi-position diaphragm carburetor, professional cutting handle, and up to 24 in. guide bar. Both models are powered by a 4.7 cu in. displacement engine and each weighs approximately 21 lbs.



Titan Chain Saw Model 4900

Propulsion Engine Corp., Subsidiary Food Machinery and Chemical Corp., South Milwaukee, Wis.

For more details circle 141 on Enclosed Return Postal Card.

Rear Dump Trailer

Easy maneuverability and smooth, controlled dumping are features claimed for the new Model TS-1622 rear dump, variable wheel base trailer now in production by Easton Car & Construction Co. The trailer is designed for use in perfect balanced combination with the Euclid (GMC) Model S-12 tractor, and will be known as the S-12 rear dump. All tractor and trailer tires are interchangeable, and the trailer tires, wheels and brake parts are interchangeable with those on the Euclid Model S-12 scraper. Rated capacity of the trailer is 22 tons, based on material weighing 2700 lb. per cubic yard.

Easton S-12 Rear Dump

Easton Car & Construction Co., Easton, Pa.

For more details circle 142 on Enclosed Return Postal Card.

(Continued on page 146)

LATONIA

TOLEDO

LIMA

CLEVELAND

NOW! 4 DISTRIBUTION CENTERS MAKE SOHIO ASPHALT SERVICE BETTER THAN EVER!

New Delivery Facilities added at Sohio's Toledo and Lima Refineries! Sohio asphalt service is now faster, more flexible than ever before! Recently expanded distribution system now includes new delivery centers at Sohio's Toledo and Lima plants as well as Cleveland and Latonia.

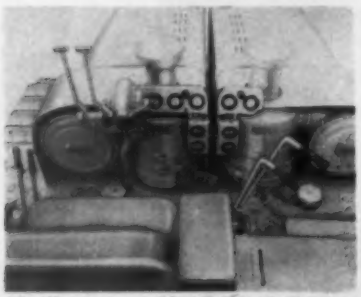
Sohio asphalt service is geared to meet contractor's needs. All four distribution centers operate round-the-clock to eliminate delays. You get your asphalt *when* you want it—*where* you want it! Next time you need asphalt, call on Sohio. Its better-than-ever service makes it your best source of supply.

SOHIO ASPHALT

. . for more details circle 307 on enclosed return postal card

New Products

(Continued from page 144)



Air Cleaners on Model TC-12 Tractor, Showing Accessibility.

Air Cleaners

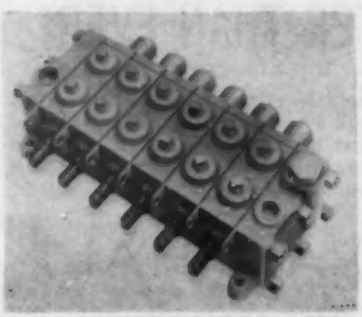
Euclid Division of General Motors has announced that current production models of the new series Euclid TC-12 tractor are equipped with two Donaldson dry-type air cleaners—one for each engine. Replacing four oil-bath units, these new cleaners are stated to be 99.9% efficient and much easier to service. The primary cleaner has a removable dust cup that can be emptied and cleaned quickly. A special paper element in the secondary cleaner has long service life because it is easily cleaned by compressed air or washing and replaced in the filter chamber.

Euclid Division, General Motors Corporation, Cleveland 17, Ohio

For more details circle 143 on Enclosed Return Postal Card.

Control Valves

A new line of multiple-section series type directional control valves, rated for pressures up to 2,000 psi, announced by Sundstrand, is designed to provide directional control of pump flow to and from actuating cylinders and hydraulic motors in systems for road machinery excavating machines, industrial tractors and similar mobile equipment.



Six Section 2,000 psi Series Type Valve

An outstanding advantage claimed for this series flow pattern of the Sundstrand valve is that it permits two or more cylinders or hydraulic motors to be operated simultaneously in a positive sequence regardless of load equality.

Sundstrand Hydraulic Division, Sundstrand Machine Tool Co., Rockford, Ill.

For more details circle 144 on Enclosed Return Postal Card.

1959 Dodge Trucks

A completely new series of pick-up trucks said to have the largest payload capacity and the biggest brakes in the industry, highlights the 1959 line of Dodge trucks. Other outstanding features of the "M" Series include two new 318-cu in. V-8 engines, increased gross vehicle weights for tandems, concealed step running boards, a new hydraulically-operated clutch, and an all-new instrument panel and instrumentation.

Dodge D700 Dump Truck Has GVW of 25,000 lb and 218 hp V-8 Engine. A 5-speed synchro transmission with power take-off openings on both sides is standard. A 3-speed auxiliary transmission, air brakes, and cast spoke wheels are also available.

The new trucks feature 6 and 8-cylinder engines with 11 different horsepower ratings ranging from 113 to 234. Maximum gross vehicle weights on the new models range from 5,100 to 49,000 lb—an increase of 3,000 lb for tandems—and gross combination weights up to 65,000 lb.

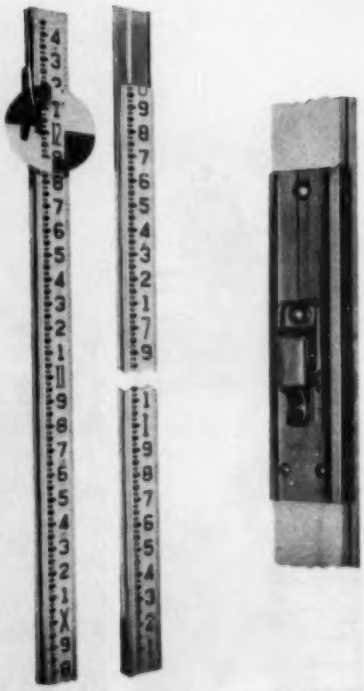
Dodge Division, Chrysler Corp., Detroit, Mich.

For more details circle 145 on Enclosed Return Postal Card.

Improved Leveling Rod

A new, three-section Detroit leveling rod that features easy reading at longer distances and is "quick to operate, completely rigid and easily portable," has been announced by Keuffel & Esser Co. They state that a new steel brace and locking device used to join the rod's three sections is a "tremendous advance" over previous methods. A latch type clamp on each brace pulls the rod sections together in metal-to-metal contact uniting the sections in virtually one continuous piece.

The rod can be used in three different lengths—four feet, eight feet or the fully extended 12½-foot length. It is easily portable, the three sections being



K & E's New Detroit Rod with "Skyline Graduations". The rear view detail at right shows rod sections joined by steel brace and locking device which K&E engineers say provides greater rigidity than other methods.

carried in a partitioned, mildew resistant bag, 4½-feet long. A new pattern of marking called "Skyline Graduations" is said to be easier to read at longer distances than the older types. The pattern and numbers are black and red on a white background and are painted directly on the wood. The rod surface is two inches wide and may be refaced; the thickness, ⅞ inch.

Keuffel & Esser Co., Hoboken, N. J.

For more details circle 146 on Enclosed Return Postal Card.

New Hydreco Motors

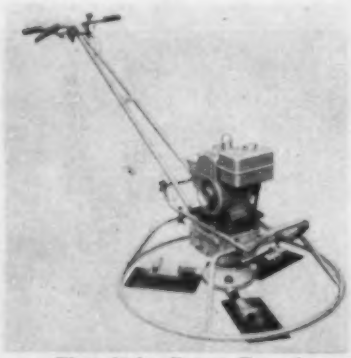
A new line of gear-type fluid motors, designated the 4MO Series, has just been announced by Hydreco Division. They are rated from 90 to 210 pounds-inch torque per 100 psi, for operating pressure to 1,000 psi. They are available in both flange and foot mountings, ports designed for S.A.E. split flange connections. These motors supplement the present Hydreco line of gear-type fluid motors rated from 12 to 84 pounds-inch torque per 100 psi for operating pressure to 1,000 psi. Performance curves and installation drawings are available on the entire line.

Hydreco Division, The New York Air Brake Co., Kalamazoo, Mich.

For more details circle 147 on Enclosed Return Postal Card.

39-Inch Power Trowel

A new 39-in. power trowel for floating and finishing concrete slabs has been inroduced by Thor Power Tool Co's. Consruction Equipment Division. The larger 39-in. trowel incorporates many of the same features as Thor's companion 29-in. model, but has the added advantage of adjustable blades which can be altered for proper pitch, while the machine is in motion, simply by operating a handle control.



Thor 39-in. Power Trowel

Blades on the new Thor T-39 are 7 x 15 in. Design features include automatic clutch, and non-rotating guard ring permitting use of the trowel within one-half inch of pipes, walls, and other obstacles.

Thor Power Tool Co., 175 N. State St., Aurora, Ill.

For more details circle 148 on Enclosed Return Postal Card.

Sauerman Durolite Block with Shrouded Housing

Shrouded Block

Sauerman "Durolite" blocks are now available with shrouded housings to insure proper seating of the running rope. The shrouds help prevent the rope from binding at the throat of the block, thus reducing breakage and cable wear. The shrouds are especially recommended where blocks must operate in a horizontal plane and there is a tendency for the rope to leave the sheave grooves. Shrouded blocks have a wide application in rigging work and in the mining field.

Sauerman Bros., Inc. Dept. W-12, 620 S. 28th Ave., Bellwood, Ill.

For more details circle 149 on Enclosed Return Postal Card.

Sweepster Jeep Broom

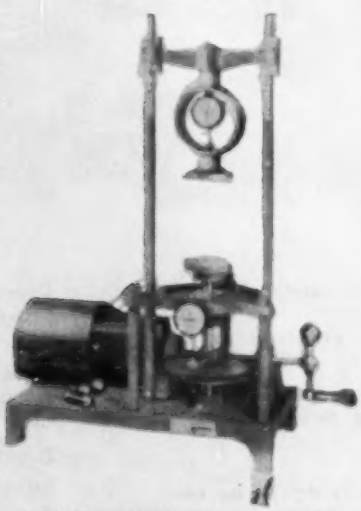
A new rotary broom, announced by Sweepster, Inc. is available for the old and new jeeps, cab forward jeep trucks and practically all makes of tractors. Furnished with positive power hydraulic systems and a simple hand crank adjustment for regulating sweeping pressures, the brooms are designed for rugged duty and minimum maintenance. They are easy to install, and can be used for clean-up, black-top patching, snow removal work, ice rink maintenance, etc.

Sweepster Jeep Broom

The brooms are offered in sizes of 5, 5½ and 6 ft. Brush diameter is 32 in.

Sweepster, Inc., 13,900 Livernois, Detroit 38, Mich.

For more details circle 150 on Enclosed Return Postal Card.



K-W Unconfined Compression Soil Testing Machine

Soil Testing Machine

The shear strength of cohesive soils can be quickly determined with the new K-W unconfined compression soil testing machine announced by Tinius Olsen Testing Machine Co.

Axial loading is accomplished by means of an infinitely variable speed drive which moves the lower sample head vertically at any constant rate from 0 to 0.15 in. per minute. The strain rate is selected by moving a short lever on the motor, and can be checked accurately with a stop watch by timing the motion of the strain dial indicator. Axial load is read directly on the load ring attached to the upper sample head while strain is measured by a dial indicator attached to the drive rod.

Tinius Olsen Testing Machine Co., 770 Easton Road, Willow Grove, Pa.

For more details circle 151 on Enclosed Return Postal Card.

Patrol-Lite New Warning Flasher

Warning Flasher

A new line of Patrol-Lite portable warning flashers has a rugged tubular steel hand truck with two 7-in. amber lights which flash alternately. The lights are operated by a regular 6-volt battery which is in a tamperproof locked box. A recharging unit is included with each unit. A new feature is an enlarged baked enamel sign panel 24 in. square available with any wording to meet requirements of contractors or municipalities.

Patrol-Lite, Box 266, Warsaw, Ind.

For more details circle 152 on Enclosed Return Postal Card.

(Continued on page 150)

announces a new mobile batch type asphalt plant...

Typical Mobile 20 Plant in West Virginia

- All units mounted on rubber-tired trailers.
- No crane needed for erection or dismantling.
- All piping and wiring permanently installed.
- All remotely located units driven by electric motors.
- Meets all State specifications.
- Diesel engine and generator for operating all electric motors.
- Cold material hoppers, with reciprocating feeder and conveyor belt.
- Dryer complete with Diesel engine, exhauster and dust collector.
- Portable insulated hot asphalt tank with oil heater.

Mobile 20

capacity range 40 to 60 tons per hour

completely wheel mounted . . . no crane needed for erection or dismantling

Now, for the first time, all the advantages of completely wheel mounted batch type asphalt plants are available in the 40 to 60 ton capacity range. This new H&B Mobile 20 plant is the last word in mobility. It can be prepared to move in a matter of minutes, and is ready to go to work as soon as it arrives at the new location.

The entire plant is mounted on rubber tired trailers. All piping and wiring is permanently installed, with quick disconnects. The combination of Diesel electric power and individual electric drives on accessory units eliminates shafts, universal joints, chains and gears. Flexible electric and hose connections between permanent piping on the various units make possible quick connections in the field. This flexibility of arrangement makes it possible to adapt the Mobile 20 to special ground site advantages or limitations.

Also available in the H&B series of complete wheel mounted batch type plants are Mobile 40 (120 to 140 tons per hour) and Mobile 60 (160 to 225 tons per hour). Bulletin M-57 will be sent on request.

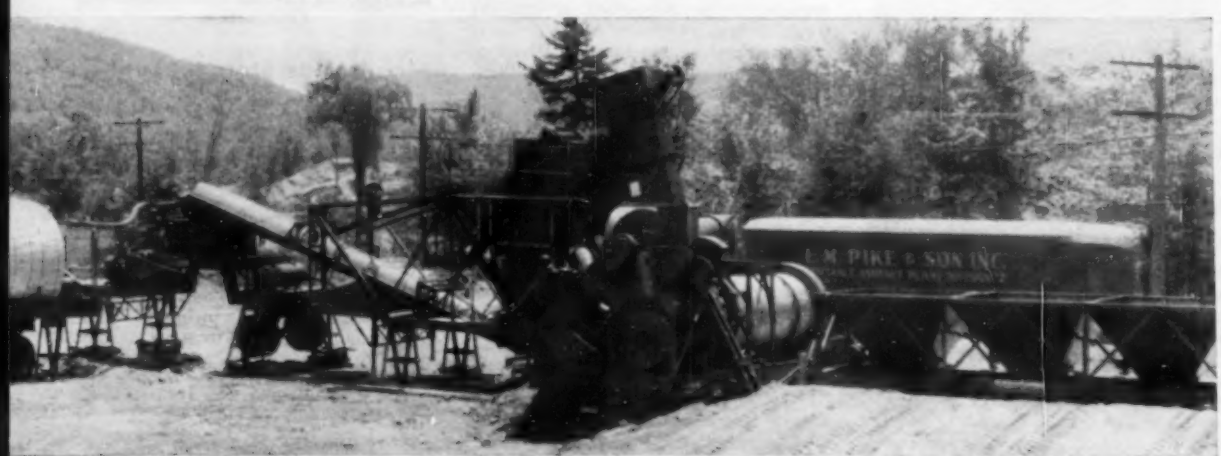
HETHERINGTON & BERNER INC. · 701-745 KENTUCKY AVENUE · INDIANAPOLIS 7, INDIANA

Export Department, 205 W. Wacker Drive, Chicago 6, Illinois—Cable Address "Panmakina"

"production beyond our fondest expectations"

—L. M. PIKE & SON
Tilton-Laconia, N.H.

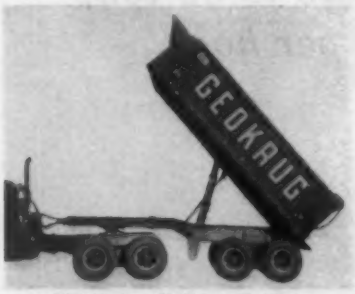
The experience of L. M. Pike & Son, of New Hampshire, one of whose H&B Mobile plants is shown below, is typical of that of contractors throughout the country. P. A. Bradbury, of Aberdeen, S. D., says: "We can move, set up and be running again in 3 days, instead of a week."



. . . for more details circle 276 on enclosed return postal card

New Products

(Continued from page 147)



ET Series Talbert Trailers

Dump Trailers

Talbert excavator dump trailers of the new ET series have normal 20 and 21-ft lengths with 21 and 25-yd capacities respectively. Bodies are manufactured from 7 gauge steel with full length I-beam sills and I-beam crossmembers. The bottom dirt shedder side rails are formed from ¼-in. stock while the top rail is a box section protected from direct impacts by an inverted angle. Supported by an H-beam frame of "Man-Ten" (high strength) steel and raised by two telescopic "Hyco" hoists, the ET series trailers will handle 35-ton loads.

Talbert Trailers, Incorporated, 7950 W. 47th Ave., Lyons, Ill.

For more details circle 153 on Enclosed Return Postal Card.

Insley Type M Excavator-Crane

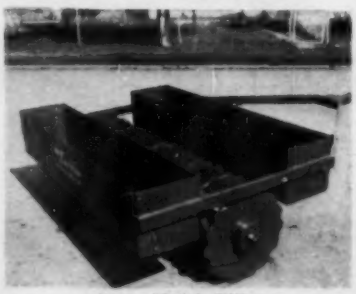
Excavator-Crane

A new excavator-crane, the Type M, announced by Insley, features an all-vision cab and new design details. On rubber, the Type M has a 20-ton lifting capacity and is available with a heavy or light truck mounting. On crawlers, it is rated as a 15-ton crane or a ¾-cu yd excavator.

Features of particular importance are counterweight removal by gantry, removable outriggers, pin (folding) boom, pendant cables, floating bridle tie-down to boom, torque converter or fluid coupling or 2 to 1 reduction transmission at motor to decrease load line speed.

Insley Manufacturing Corporation, P. O. Box 167, Indianapolis 6, Ind.

For more details circle 154 on Enclosed Return Postal Card.



Imco Mulch Tiller

Mulch Tiller

A balanced weight mulch tiller, developed by Independent Mfg. Co. for use on road shoulders, embankments, levees and water sheds, is stated to have proved particularly efficient for anchoring straw or other mulch in the soil surfaces. It is built on a low line of gravity, and weight can be added by sand or gravel in boxes. It is constructed with nine ¼-in. by 20-in. blades, spaced at 8 in. It is 6 ft wide and has a 1,000-lb net weight.

Independent Mfg. Co., Inc., Box 208, Neodesha, Kans.

For more details circle 155 on Enclosed Return Postal Card.

8-Cu. Yd. Scraper

A new "Michigan" Model 110 four-wheel scraper has a capacity of 8 cu. yd. struck and 10½ cu. yd. heaped. It is 27 ft. 7½ in. long. 8 ft. 6½ in. wide and 9 ft. 6 in. high. Empty weight is 14,450 lb.; fully loaded, 40,450 lb. Teamed with a Model 180 tractor dozer or equivalent prime mover, the Model 110 offers all-hydraulic control. The scraper's cutting edge consists of four interchangeable and reversible sections to permit offset or straight blade arrangements.

Construction Machinery Division, Clark Equipment Co., Pipestone Road, P. O. Box 599, Benton Harbor, Mich.

For more details circle 156 on Enclosed Return Postal Card.

Blast-Hole Drill

Ingersoll-Rand's "Drillmaster" is now available with a "beefed-up" mounting, that, according to the manufacturer, makes the blast-hole unit even more rugged and portable than before.

Set-up time for the unit, called the "TRUCM-3 Drillmaster," is said to be only a few minutes because the drill tower is raised and lowered by hydraulic power, putting the I-R "Downhole" drill into action almost immediately. This drill, which follows its steel right down the hole, is stated to have drilled 350 ft of hole during a single 8-hour shift. Further, it can be used as a heavy-duty rotary unit when soft, non-abrasive overburden and bedrock must be worked. Air supply is provided by a 600-cfm Gyro-Flo rotary compressor that reportedly needs little attention or maintenance.

Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

For more details circle 157 on Enclosed Return Postal Card.

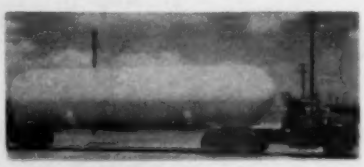
New Tool for Logging

The D4 "Integral Arch", a new tool for the logging industry, announced by Hyster Co., is installed to perform as an integral part of the tractor and is designed to provide the production benefits of a trailing arch without the loss of tractor maneuverability.

Designed for use with Cat D4 tractor and Hyster D4D or D4N winches, the arch mounts on the winch drum shaft and is anchored to the tractor by means of backstay struts welded to the track roller frames. Full track oscillation is retained by an equalizer beam that allows movement of the backstay struts to compensate for oscillation of track roller frames. Anchoring arch to track roller frames allows full use of counterweight effect of tractor without detrimental reverse bending of tractor equalizer spring. Line load capacities range from 11,400 lb for vertical pull, to 6,650 lb for 60° pull.

Hyster Company, 2902 N. E. Clackamas St., Portland 8, Ore.

For more details circle 158 on Enclosed Return Postal Card.



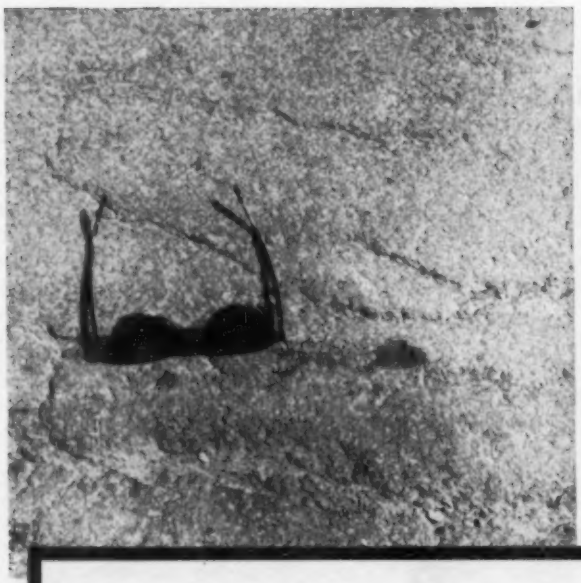
Storage Tank Used by Werner's Inc., in Supplying LP-Gas Fuel to Highway Contractors

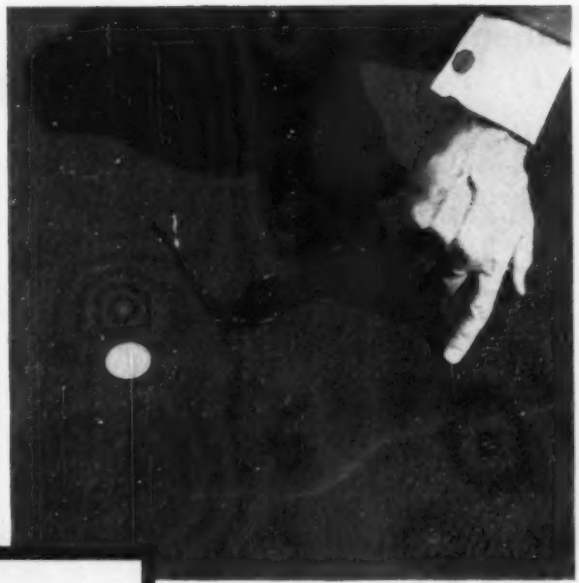
Mobile Gas Storage Tanks

Mobile storage units, designed for LP-gas fuel, developed by The J. B. Beaird Co., utilize both bulk storage and trailer transport features. The unit consists of a tank ranging from 9,000 to 14,000-gal capacity, on running gear, which in turn mounts on a tractor. In operation, the tank rolls to location, where it is jacked up, set onto piers, running gear detached, and the tractor moved. The tractor winches the running gear and takes off to move another storage tank.

The J. B. Beaird Co., Inc., Shreveport, La.

For more details circle 159 on Enclosed Return Postal Card.





BITUMULS SLURRY SEALS ARE REAL LIFE SAVERS*

For Pavements in Rochester, New York

*By permission of Beech-Nut Life Savers, Inc., for candies

LEFT: A typical section of pavement to be treated with Bitumuls Slurry Seal in Rochester.
RIGHT: The same pavement section after treatment with Bitumuls Slurry Seal. (Note how the crack in the foreground has been sealed).

The City of Rochester, New York, was faced with a problem common to many communities today: keep all streets maintained in serviceable condition; yet do it at a cost that will permit the complete replacement (out of Maintenance Department funds) of many miles of streets that are over-aged.

Problem: How can you keep overall maintenance costs low enough to permit planned replacement of certain streets?

Answer: Bitumuls Slurry Sealing . . . a "life saving" technique for keeping distressed pavements in "good working order". Streets that were badly oxidized, cracked and open-textured due to a combination of age, heavy traffic, and winter weather were readily rejuvenated by the sealing, crack-filling and void-filling properties of Bitumuls® emulsified asphalt slurry.

Bitumuls Slurry Seals actually provided a holding action against wear and weather at extremely low cost. Savings over former methods were pronounced because very-costly winter patching of chuck-holes was completely eliminated. As a result, expenditures for repair and control of winter damage were **reduced by almost seventy percent!**

The money thus saved was diverted to reconstruction of streets that were beyond maintenance or repair.

Bitumuls Slurry Sealing is normally . . . and should be . . . regarded as only a **temporary treatment** for distressed pavements. Adequate repairs or pavement-replacement must eventually be made. Yet it is truly a "Life Saver", since it seals, protects and preserves any basically sound pavement against further deterioration until such a time as major repairs can be made, or the pavement can be replaced.

Typical view of the high-speed, high-efficiency Bitumuls Slurry Sealing in Rochester.

Your community, too, can benefit from the use of Bitumuls Slurry Seals. For further information on Slurry Sealing . . . or for the complete Bitumuls/Life Saver story . . . call our nearest office.

American Bitumuls & Asphalt Company

320 MARKET, SAN FRANCISCO 20, CALIF.
Perth Amboy, N. J.
Baltimore 3, Md.
Cincinnati 38, Ohio
Atlanta 8, Ga.
Mobile, Ala.
St. Louis 17, Mo.
Tucson, Ariz.
Portland 8, Ore.
Oakland 1, Calif.
Inglewood, Calif.
San Juan 23, P. R.

. . . for more details circle 236 on enclosed return postal card

Changes in Flexible Pavement "Specs" for North Carolina

Several significant changes in the flexible pavement specifications in the state of North Carolina were announced recently by officials of the state highway Commission. The revisions were brought about through the joint work of the Carolina Asphalt Association, NBCA, the consulting firm of Miller-Warden Associates, and the engineers and officials of the state's Highway Commission.

1. One of the first revisions concerns the mixing time and temperature for bituminous paving mixtures. The following now appears in the state's specifications: "Optimum mixing temperature for this mixture will be determined on the basis of the viscosity-temperature relationship of the particular asphalt used, and will be given along with the approved job mix formula. The contractor is cautioned that any mix temperature outside the established range will result in absolute rejection of the particular batch or truck load involved.

The minimum mix temperature, according to the State's new specifications, will be that *temperature at which the aggregate can be properly coated,* transported to the job, laid and compacted in the field—all providing a wide operating range. It is felt that the main danger from the contractor's view would be producing mixtures near or at the upper temperature limit. Industry representatives believe this system will eliminate, or certainly minimize, the large drop in penetration and ductility which has been experienced in recent years in the State.

2. Also, additional laboratory tests are being put into effect under the new provisions. These tests are expected to detect asphalt of inferior quality which may be proposed for use. They include the Bureau of Public Roads' thin film oven test, the temperature susceptibility test, and the low temperature ductility—60 degrees F. It is also planned to perform the Absons Recovery test to determine if excessive hardening is taking place in the asphalt material.

3. Another highly important revision acknowledges the concept that batch size should be determined by *mixer efficiency.* Under the new specification: "the size of the batch (bituminous mix) will be limited to that which can be mixed in one minute total mixing time as determined by the complete and uniform coating of all aggregate particles. When mineral filler is added, a dry mixing time of 15 seconds will be specified."

4. A new provision that is being put into immediate effect is that "all subgrades and flexible bases will be proof rolled, unless otherwise directed."

5. Other changes in specifications include: "three wheeled, two axle or three axle tandem, or self-propelled pneumatic tired rollers will be allowed and compaction requirements will be rigidly enforced."

Look at the uniform triple-lap coverage and straight edges you get with a "Black-Topper"

You can see the results of Etnyre's exclusive triple-lap coverage (spray from each nozzle overlapping *two* other sprays) in the unretouched photograph above. Road builders have learned that single-lap coverage is utterly unsatisfactory . . . double-lap coverage somewhat better . . but triple-lap coverage is the complete answer to hitting rough aggregate from all possible angles for complete coverage.

Moreover, by turning the end nozzle as indicated, you get a sharp line edge which adds the finishing touch to the job. With this accurate alignment, you can spray right up to the edge of curbs. Such dependable operation and uniform, accurate distribution are typical results you can expect from an Etnyre. Investigate today — find out how soon a "Black-Topper" can be delivered to you to handle your work faster, better, more economically!

E. D. Etnyre & Co., Oregon, Illinois

SEE YOUR ETNYRE DEALER

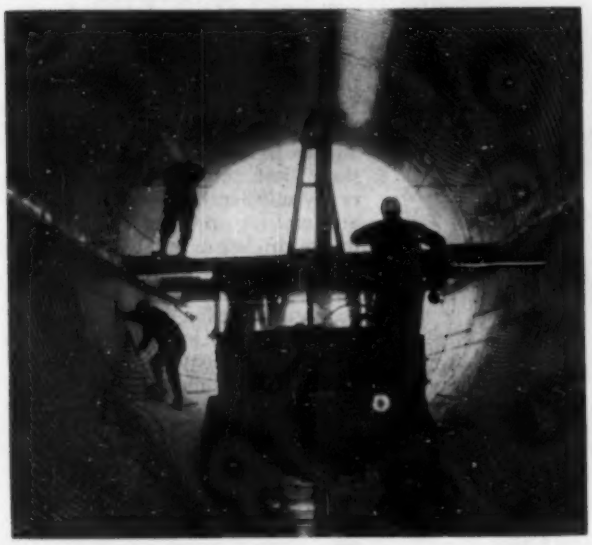
ETNYRE

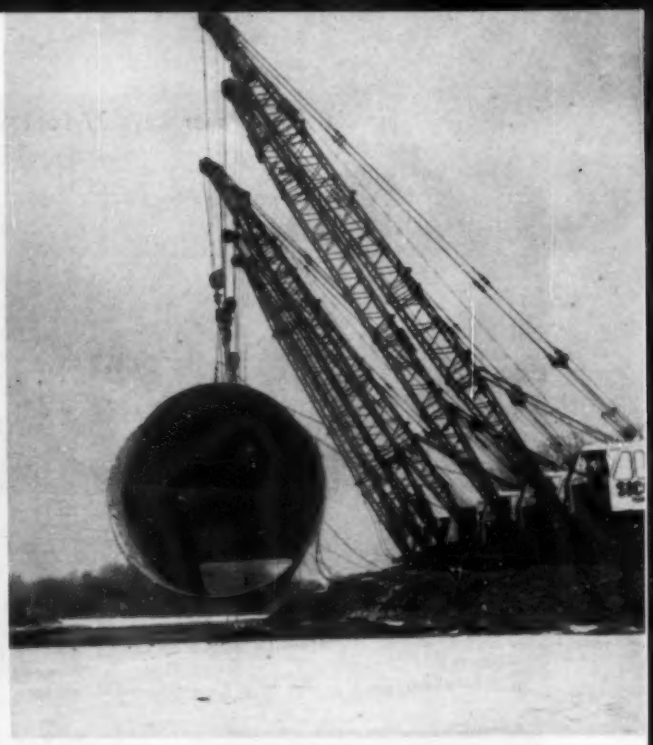
"Black-Topper"

BITUMINOUS DISTRIBUTORS

. . . for more details circle 265 on enclosed return postal card

Six Cranes Team Up to Set Big Pipe





Six 30-ton cranes lifted this 176-ft. length of Armco 18-ft. diameter, 1 gage, Multiplate pipe and lowered it into about 10 ft. of water. Besides serving as a drainage structure, this structure, second largest of its kind in Canada, is located at St. Rose, Province of Quebec, as part of the first toll road in Canada (39 miles long) from Montreal into the Laurentian Mountains. Left photo shows timber struts being placed to maintain the horizontal diameter during lifting. Right, pipe in mid-air ready to lower.

The Birth of a Job

SOMEONE MUST THINK

A new job is created by someone thinking up a new process, a new service, or a new product.

SOMEONE MUST PLAN

A plan for a new process, a new service, or a new product must be drawn up and tested for usefulness and consumer acceptance.

SOMEONE MUST INVEST

After an idea for a new process, service or product has been created and plans drawn up, someone must invest an average of $12,000 in plant, tools and equipment to *create just one job for one person.*

SOMEONE MUST GUARD

People will only invest their savings in business and industry, thereby creating new jobs, if the return involved is worth the risk. When taxes take too much, new jobs are not created and old jobs are not secure. Someone must guard the opportunity to realize a fair return on investment.

SOMEONE MUST EXPLAIN

That if a single man spends only $3,000 a year for living expenses, he must earn a total income of approximately $25,000 to have $12,000 left to invest in a business enterprise which then can create only *one job.*

SOMEONE MUST PROTEST

We have an obligation to our children to protest the high discriminatory rates which restrain investment in new business ventures and the creation of jobs so vital to their future and the future of our nation.

Tell your neighbors—tell your friends—tell your congressman. We must reduce the high discriminatory tax rates which restrict the creation of new jobs and take away the security of present jobs.

Virginia Road Builders Association.

(And saved an apparent $200 per day compared with a contract bid, according to cost figures from the utility company which did the work.)

Solving Drainage Problems

SOLVING DRAINAGE PROBLEMS. Manufacturers of Corrugated steel riveted culvert pipe, as well as designers, engineers and others who must plan and execute installations where drainage and loading problems are encountered, will be interested in and find useful the second edition of Bethlehem Steel Company's booklet, "Solving Drainage Problems," just off the presses.

To be had free by writing to Bethlehem's Publications Department, Bethlehem, Pa., this 76-page illustrated brochure contains, in addition to a wealth of descriptive information, charts and data, new tables for the evaluating of flow friction that will greatly simplify planning and design under most conceivable conditions.

Bethlehem Steel is not a fabricator of culvert pipe but *is* the producer of a special copper-bearing steel—Beth-Cu-Loy—which has found wide acceptance as the perfect steel for corrugated culvert service. The booklet, while it points out the advantages of Bethlehem's product, also calls attention to the many advantages of corrugated sheet steel over more rigid materials in the manufacture and installation of drainage culverts, such as long life, ease of fabrication and handling, low relative cost, and other important factors.

Special Base Paver Lays 27-Foot Width

Specially designed base paver seen at work on Route 25 highway relocation project near Wapakoneta, Ohio. The 27-ft. wide Blaw-Knox unit (with extended wings) reportedly reduced spreading time 50 percent over former methods. It is designed to spread three truck loads of bank gravel per minute under push power of a Caterpillar D9 tractor.

Biggest-Yet Off-Road Tire

The world's largest regular production tires, 3,355-lb. giant manufactured by The Firestone Tire & Rubber Company, towers in this picture. The tire, over 9 ft. high, is part of equipment for moving oil pumping stations over the Saudi Arabian sands. Each tire contains 1,763 lb. of natural rubber, 418 lb. of fabric and more than 27,000 ft. of beadwire. The tires are mounted on equipment constructed for the Arabian American Oil Company by the Eidal Manufacturing Company.

Watch Surface Drainage

Driving in water during and after a rain or in slush after snow removal is hazardous to the driver and to other vehicles. So notes Fred Swineford, highway engineer, Columbus, Ohio, who observes that pavements with flat grades and flat crowns will not drain quickly after a rain.

Mr. Swineford's further comment will also make useful reading to road designers, whose job these days often is to pioneer new refinements but do so sensibly and with an eye to fundamentals. We quote:

"Superhighways, local roads and streets should, whenever possible, slope both longitudinally and laterally sufficiently so that rain water and melting snow will quickly get to the ditches or inlets.

"Lip curbs were placed on many pavements in the 1930s. They have been discontinued because they held water on the pavement. Now with sloping paved shoulders we must provide sufficient slope in the pavement to drain the water to and off the shoulders . . . Adequate and quick surface drainage helps the driver and reduces pavement damage."

"Temporary" Paving Record

Claims for records in daily progress of pavers frequently bob up. One is the footage given for Sargent Construction Co., of Saginaw, Michgan. During July this firm working on US-12 near Galesburg, Michigan, placed 5,787 lin. ft. of 9 in. by 24 ft. pavement in a single working day. Only the one-day push of another firm (page 54 of this issue) has ever topped this footage.

This mile-plus day started about 5:00 A.M., with the purpose of beating all known records. The crew worked until 6:00 P.M. with only one half hour equipment down time for lunch.

According to Roland Sargent, as reported by *Michigan Roads And Construction*, the crew could have laid an additional thousand feet had they worked until dark, but thinking that they had already set a record, they called it quits at 6:00 P.M.

The paving train consisted of two Koehring and one Rex pavers, two Blaw-Knox spreaders, a Jaeger finishing machine, and a Heltzel Flex-Plane transverse finisher, all supplied by a Butler batch plant and 16 tandem-axle trucks, or several more than the usual number used.

• Steel in modern highways averages 500 tons per mile—figure pertains to primary and interstate highways. Structural shapes count 40% of steel tonnage, steel plates 20%, steel piling 16% and concrete reinforcing bars 12%.

SWENSON SPREADERS
FOR ICE CONTROL

SPREADS SALT 200 LBS. PER MILE
OR IN ANY DESIRED AMOUNT
Lays a Narrow Strip or Full Traffic Lane

Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

Write for complete information

SWENSON SPREADER & MFG. CO.
LINDENWOOD, ILLINOIS

. . . for more details circle 308 on enclosed return postal card

Manufacturers' Literature

VULCAN IRON WORKS CO., 2960 South Fox St., Englewood, Calif., has issued a new "Portocut" saw bulletin illustrating and describing heavy-duty production chain saws. Included are electric and compressed air-operated chain saws of 20-in. capacity and up.

For more details circle 160 on Enclosed Return Postal Card.

HIGHWAY TRAFFIC SIGNS: California Metal Enameling Co., 6904 E. Slauson Ave., Los Angeles 22, Calif., has issued a catalog designed to provide all information needed to expedite and simplify the ordering for porcelain enameled traffic signs. Included are traffic sign sizes, designs and prices. Types of signs available are covered in statistical and diagrammatic material. Sign accessories are also covered. A 58-page supplement, "Planning Manual of Instructions Part 8, Traffic Signs" is available on request.

For more details circle 161 on Enclosed Return Postal Card.

SYNTRON COMPANY, 384 Lexington Ave., Homer City, Pa., has published a new 30-page catalog on its standard and special model electromagnetic vibrating feeders for hard-to-handle bulk materials.

For more details circle 162 on Enclosed Return Postal Card.

BUFFALO-SPRINGFIELD ROLLER CO., Division of Koehring Co., Springfield, Ohio, has released a new illustrated 12-page Bulletin No. S-74-858 covering its entire and expanded line of road rollers and compaction equipment. Starting with Buffalo's new KT-7A and KT-8 portable tandem rollers, with or without optional towing attachment and with the hydraulically retractable "fold away" wheels, the bulletin outlines construction and performance features. Standard-duty and heavy-duty 2-axle tandem rollers, 3-axle tandem rollers, heavy-duty 3-wheel variable weight rollers and the K-45 "Kompactor" are also described.

For more details circle 163 on Enclosed Return Postal Card.

"YEAR ROUND CONCRETING", an 8-page pamphlet, available from the Calcium Chloride Institute, 909 Ring Building, Washington 6, D. C., summarizes the new American Concrete Institute's standard recommendations for cold weather concreting. It tells how calcium chloride and other developments aid in placing durable quality concrete in cold weather.

For more details circle 164 on Enclosed Return Postal Card.

Rosco Roller owned by Jay W. Craig Co., Minneapolis, on job at Aitkin, Minn.

Increase Operator Efficiency and Produce More Work Per Hour with the ROSCO ROLLER SR-9-T2

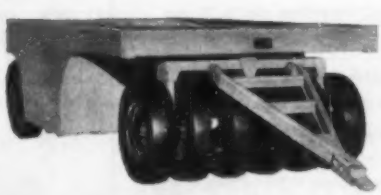
★ Torque Converter ★ Reverse-Omatic Drive

★ Constant Speed ★ Power Brakes and Steering

With this improved 9 wheel self-propelled roller your operator can surface nearly a 6 foot width at working speeds up to 15 MPH. The torque converter and Reverse-Omatic clutch and transmission eliminate scuffing of the surface. Power steering and a throttle setting device that returns to manual at a touch reduce operator fatigue and produce more work per hour.

A modern large-bore, short-stroke engine produces a surplus of power and travel speeds to 30 MPH. Water compartments are integral with the body and other components are set low for safe center of gravity and operator visibility. These features and Rosco's quality construction make the SR-9-T2 a solid investment and profit maker.

Rosco Roller SR-9-T2 with water attachment



Models CR9 and CR13

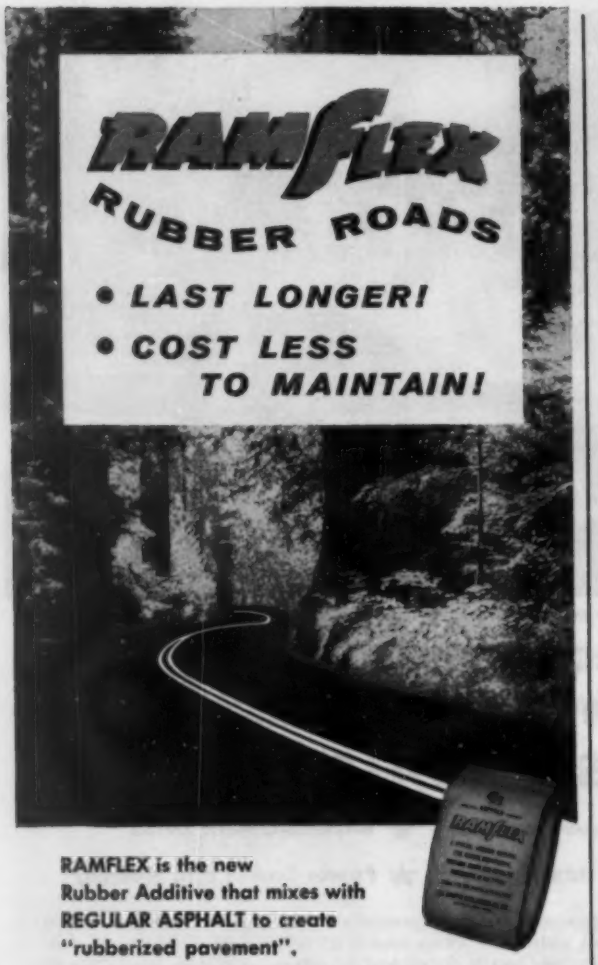
9 or 13 wheel tow-type rollers, 90 and 120 cubic feet capacity.

ROSCO MINNEAPOLIS

ROSCO MANUFACTURING CO.

3118 SNELLING AVE. • MINNEAPOLIS 6, MINNESOTA

. . . for more details circle 303 on enclosed return postal card



RAMFLEX is the new Rubber Additive that mixes with REGULAR ASPHALT to create "rubberized pavement".

RAMFLEX requires no special equipment and the paving mixture spreads rapidly, evenly and uniformly. The paving won't "shove" after placed, resists cracking in cold temperatures, and "bleeding" in hot weather. Stripping and raveling of road edges is reduced to a minimum. In addition, hot patches last far longer when made with RAMFLEX. This all means lower paving costs and practically NO maintenance.

All these advantages have been PROVED on successful state, county, city and private paving installations. Why don't you be the one to introduce the revolutionary new RAMFLEX Rubber Road to your local paving program. Regular contractors do the paving . . . we supply the RAMFLEX in convenient size bags. Write for the money saving facts, today.

Send for this illustrated
FACT FOLDER

Every paving contractor, every government official connected with paving programs should read this informative folder.

U.S.
RUBBER RECLAIMING CO., INC.
P. O. BOX 365 BUFFALO 5, NEW YORK

. . . for more details circle 318 on enclosed return postal card

MANUFACTURER'S LITERATURE

MOBILE SOIL-TESTING LABORATORIES: Test programs for soils explorations, soils studies and quality control of concrete and asphalt can be carried out with a line of mobile testing laboratories described in a profusely illustrated brochure, ML 100, just announced by Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill. Both truck-mounted and trailer units are covered.

For more details circle 165 on Enclosed Return Postal Card.

DESIGN AND FABRICATION PRACTICES FOR EFFICIENT WELDED HIGHWAY BRIDGES are presented in a 4-page brochure, "Lincoln Studies in Structural Arc Welding No. 147" just issued by The Lincoln Electric Co., Cleveland 17, Ohio, and available to engineers, shop supervisors, and executives.

For more details circle 166 on Enclosed Return Postal Card.

BARBER-GREENE COMPANY, Aurora, Illinois, announces a 192-page conveyor catalog, for installations using all standardized components, all specially designed components, or combinations of both.

For more details circle 167 on Enclosed Return Postal Card.

MANHATTAN RUBBER DIVISION of Raybestos-Manhattan, Inc., Passaic, New Jersey, has issued a 12-page brochure covering its new Ray-Man Conveyor Belt. It is claimed that no breaker fabric is required with this belt, which means more thickness of the cover is utilized. Other advantages claimed are: greater flexibility, more resilience to shock loading, longer life for vulcanized or fastener splices, more rip resistance, and suitability also for 45° idlers for greater capacity. Copy is available by writing for Bulletin M302.

For more details circle 168 on Enclosed Return Postal Card.

STAINLESS STEEL THERMOMETERS in five dial sizes from 1 in. to 5 in., with stems from 2½ in. to 72 in. long, and in twelve Fahrenheit or Centigrade ranges to suit any heatmeasuring requirements are described in a profusely illustrated booklet from W. C. Dillon & Co., Inc., 14620 Keswick St., Van Nuys, Calif.

For more details circle 169 on Enclosed Return Postal Card.

AIR REDUCTION CO., INC., 150 East 42nd St., New York 17, N. Y. has issued a 52-page welding supplies and accessories catalog, covering Airco's complete line of fluxed and ferrous and non-ferrous rods for gas welding; and accessory items including protective clothing, goggles, electrode holders, sparklighters, cable, hose, weld cleaning tools, cylinder trucks and many other items, for both arc and gas welding.

For more details circle 170 on Enclosed Return Postal Card.

HYDRAULIC EQUIPMENT FOR INDUSTRY—pumps, valves, motors, controls, cylinders, hydra units—is covered in a loose leaf catalog and parts list just issued by Hoen Hydraulic Corporation, 630 W. 17th South, Salt Lake City, Utah. Photo illustrations, detail drawings, and specifications are included.

For more details circle 171 on Enclosed Return Postal Card.

ENGINEERS — FOREMEN — OFFICE MEN
Learn latest methods to organize and run work. Prepare for the top jobs. Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
SATSUMA, FLORIDA

FOR SALE

2—Rebuilt Lorain Moto-Cranes
MC-3 15 tons . . . $15,000.00
MC-414 20 tons . $15,000.00

1—#2 Vulcan Pile Hammer, almost new. Complete with 46′ leads and 75′ hose $6,000.00

1—Jaeger 250 Air Compressor, used very little.

1—Universal 5-ton Truck Crane, 24′ boom $1,000.00

George J. Igel & Company, Inc.
P. O. Box 6147 Phone: CA 1-6601
Mound and Sandusky Sts.
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EARTH MOVER
TIRES

Unused 18:00 x 24 Wheels, tubes, axles available . . . $150

Unused 11:00 x 20 14 ply N.D. . . . . $ 50

First line, complete with tube and flap.
With 10-hole Budd wheel—mounted. . . $72.50

Brand New! Latest type! Austin-Western 8000-lb. HYDRAULIC CRANES

Cost gov't. $8,700 Our price $2750

Complete with cables and outriggers.

WAUKESHA ENGINES

SRK low-mileage takeouts with all accessories $495

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Check our prices on Army Surplus 4x4 and 6x6 trucks.

All prices FOB Akron, Ohio

SAM WINER MOTORS

Send for catalog on engines, fork lifts, and fork lift parts.
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FOR SALE

International 1091 Power Unit (UD-24) equipped for Butane or Natural gas. Long skid base, extended shaft, outboard bearing and V-belt sleeve. Practically new.

Pioneer Portable secondary crusher unit. Model 140 with 40x22 Roll, 4x10 screen Caterpillar D13000 power.

Set of Symons 3′ standard mantle and bowl liner, coarse bowl. New, never used.

½ yd. Link-Belt Dragline LS-40 with Caterpillar Engine.

Bucyrus-Erie 22T Churn Drill with set of Tools, crawler mounted.

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FOR SALE:

Current Model Cleveland 320 ditcher. Cat Power 12½′ Wheel. 40″ Wide Trench, 7 feet deep. Only 400 hours. A real bargain, as this machine is in excellent condition.

WILSON EQUIPMENT & SUPPLY CO.
Write Box 218 Phone 25581
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GOOD USED MACHINERY FOR SALE OR RENT

Used D-6 CATERPILLAR Tractor with traction traxcavator, Mach. No. 9V2885. Condition Good.

Used BARBER GREENE Model 550 Belt Loader, No. 550-5554. New Machine guarantee.

Used BARBER-GREENE Model 705A Ditcher, No. 705A-51-31 Le Roi gasoline engine, 7½″x48″ and 5½″x48″ bucket line, cab, spoil conveyor, back-filling blade. Reconditioned.

BUCYRUS ERIE ¾ cu. yd. Dragline bucket type AX, No. BB-5. New. Yard Worn. Excellent price.

Shovel Attachment for 205-A Koehring, complete. Machine No. C-4908-4131. LIKE NEW. Used once.

KOEHRING 301 Combination Dragline-Clamshell, 50′ boom (Spare Parts for engine and machine), powered with Wisconsin Radiator Cooled Engine. Machine No. 1539. RUNNING.

LORAIN Model L-40 Dragline 40′ boom, powered with Waukesha 6 cylinder gasoline engine. Machine No. 9559. ENGINE REBUILT. GOOD WORKING CONDITION.

Used SCOOPMOBILE Model "C" mounted on pneumatic tires. Chrysler gasoline engine, No. C-4634. Reconditioned.

Used BROS Model 26-T portable steam generator, Wisconsin gasoline engine, mounted on two pneumatic tired trailer. Reconditioned.

Used KIESLER Clamshell bucket, material handling type 1¼ cu. yd. capacity, size 750, No. 2233. Condition, Excellent.

Used BLAW-KNOX Concrete Finisher model XE-20′-25′ with hydraulic transportation wheels. Integral curb attachment, machine new 1956. Laid less than 10 miles. Condition Excellent.

Write, Wire or Phone For Prices

FUCHS-CLAYTON MACHINERY COMPANY

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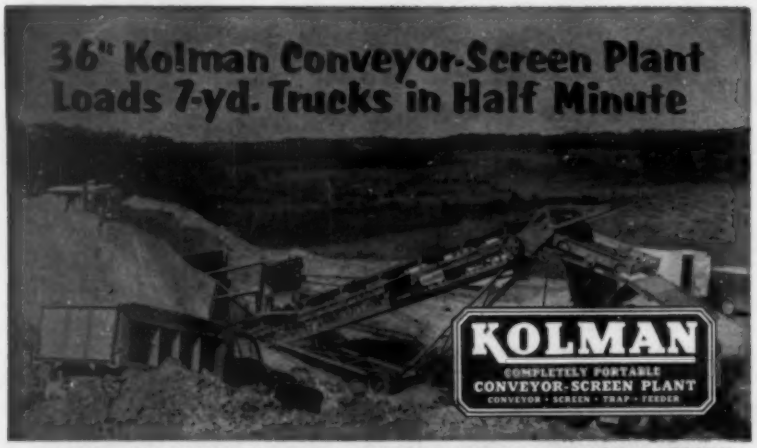

DAMP-TO-WET GRAVEL HANDLED IN RECORD TIME

Contractors throughout the country are finding that the Kolman Model 101 Conveyor- Screen Plant comes through with top production under the severest operating conditions.

Here 7-yard trucks are loaded with damp-to-wet gravel in half a minute and ten-yard trucks in than a minute — over 800 tons an hour — by the Zaske Construction Company of Morton, Minn. And Kolman's rugged construction permits handling these heavy loads at constant rates without fear of excessive maintenance expense.

Kolman builds conveyors that are brutes for production and for taking abuse — 18" to 42" belts on portable or stationary units of any desired length, capable of carrying single, two- and three-deck screens without additional support. With Kolman's folding feature, the single-deck screen need not be removed for transportation.

A steel dozer trap with built-in plate feeder, available as optional equipment, is an integral part of the conveyor and fully portable.

Best of all, Kolman Conveyors are competitively priced. Get the whole story before you buy any conveyor or screen.

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Model 25 Northwest Backhoe, gas motor, wide pads; F.O.B. East Hartford $5750

Set D8 used tracks, pin and bushings good; chains and pads 40-50% wear left. F.O.B. E. Hartford..$450

Allis-Chalmers HD20 Dozer, hydraulic blade; good condition. F.O.B. East Hartford $10,000

Model 25 Northwest Crane, gas motor, wide pads; F.O.B. East Hartford $4000

Allis-Chalmers Model D Grader; excellent condition F.O.B. East Hartford $4500

Set Sheepsfoot Roller; excellent condition; East Hartford.....$950

Dismantling AC HD7-HD10-D4-D7-D8-HD19-TD18; parts for sale.

4 C.Y. HD20 Front End Loader, Allis-Chalmers; heavy duty rock bucket; good condition; F.O.B. East Hartford $11,000

Used Cat. D8 motor, 2U series; 1 Used Cat. D7 motor, 3T series.

Allis-Chalmers HD15 Dozer, cable control; good condition. F.O.B. East Hartford $6250

Unit 1020A Backhoe attachment, camel back, used; F.O.B. East Hartford $1500

Used 671 GM Diesel motor, complete; F.O.B. East Hartford...$650

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TEN B81SX MACK 10-12-CY DUMP TRUCKS

MANITOWOC 3500B 2½-CY SHOVEL

McCONVILLE, INC.

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2 Cleveland Model 140 Ditching Machines in excellent condition. f.o.b. Houston. Ea..$ 6,500.00

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ORIGINALLY COSTING MORE THAN $2,000,000.00

1st Annual Southern Equipment. Bonded * Liquidation Miss. State Fair Grounds, Jackson, Mississippi.

Thursday, Dec. 4, 1958 — Inspection Starts
10:00 A.M. (CST) — November 24, 1958

The Jackson, Mississippi firms of Southern Equipment Sales, Stribling Bros. Machinery Co., W. L. Wells, Gerald Smith Co. Inc., Allied Equipment, Inc. Emmett Swilley, Contractor, Inc. and Aldridge-Harbour have commissioned Wayne Cook Assoc. Inc. to conduct a joint disposal auction of heavy construction equipment belonging to them. Most of this equipment is in near new condition ready to go to work.

A FINE OPPORTUNITY TO BUY HEAVY CONSTRUCTION EQUIPMENT

***BONDED AGAINST BUY-BACKS**

To assure each buyer that there are no minimums, no reservations, no buy-backs, etc. on this equipment, Wayne Cook Associates, Inc. will conduct this sale under its unique and original "BABB" (Bonded against Buy-Backs) Plan. A $100,000.00 bond by *St. Paul Fire & Marine Insurance* Co. has been posted by the auctioneers to guarantee this to all buyers.

EACH PIECE MUST AND WILL BE SOLD REGARDLESS OF PRICE!!

Equipment to be auctioned includes:

9 Cat. DW21 Scrapers; 3 Cat. DW15s; 4 Cat. DW10s; 2 Cat. D9 Tractors; 13 Cat. D8s; 1 Cat. D7; 4 Cat. D6s; 1 Cat. D4; 3 Cat. #12 Motor Graders;

Also:

3 A.C. TS-300 Motor Scrapers; 1 A.C. HD21 Tractor; 2 A.C. HD20s; 2 A.C. HD5-Gs; 2 LeTourneau Mod. D. Roadsters; 1 Let. Mod. LP Scraper; 1 Let. Mod. M; Euclid Mod. S-7; Adams Mod. 550 and 414; Mod. 25 Northwest; Link Belt HC88 Truck Crane; Link Belt LS 51; Koehring Mod. 16E Paver AND MANY MORE SUCH ITEMS.

THIS SALE IS A MUST FOR YOU, with BONDED BUYER PROTECTION. EVERYTHING MUST BE SOLD!!! CALL, WIRE, WRITE NOW FOR FREE BROCHURE WITH COMPLETE LISTING.

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Good Used Contractors Machinery

AT A SUBSTANTIAL SAVING

1—Bucyrus Erie 22-B Dragline.
1—Northwest 25-ton Moto-Crane.
3—Cat. D-8 Dozers.
1—AC HD-21 w/push plate.
4—Cat. D-W-21 Motor Scrapers.
1—LeTourneau LS Scraper.
2—60" Double Drum Sheepsfoot Rollers.
2—Ferguson 50-ton Pneumatic Tired Rollers.
2—IH Model I-9 Rubber-tired Tractors.
5—9-wheel Pneumatic Tired Rollers.
2—CH & E—6" Centrifugal Pumps.
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1—Browning Model TC-15 17½ ton truck crane mounted on 6 x 4 Hendrickson carrier, complete with remote control from crane operator's position, 95' boom, 15' jib; condition good — F.O.B. Cleveland, Ohio $11,000.00

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ALL NEW 1ST QUALITY
ALL TYPES - ALL SIZES
Over 1 Million Feet to Sell
Random Lengths
Most All 20 Feet and Over

For Low Prices, Send in Your Needs

Hydraulic Hose 2 Wire Braid, 3/16" to 1¼"	I.D.
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Suction Hose in Short Lengths Only, 8' to 12'	
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Jack Hammer Hose, Pile Driver Hose, Fuel Hose Plus Most Anything in the Hose Line.

Special Discount To Dealers In Large Quantities

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1¼" 2 or 3 Ply Air or Water Hose, 20 ft. and up—15¢ per ft.—30,000 Ft. on Hand.
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Black Rubber Matting, Smooth Non-Skid Type

⅛" x 38" wide x 28 Ft. Long—$7.00 Per Roll of 28 Ft.—500 Rolls on Hand.

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CHECK THESE BARGAINS

Osgood Model 805 #3411 Crawler Crane - Clamshell, 1½ yard, Cat D-13000 with 50′ 2-piece Boom. Used only 650 hours. F.O.B. $18,500.00

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Link-Belt LS75 ¾ yard Crawler Shovel and Backhoe, Cat 4600 diesel. F.O.B. 7,500.00

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Caterpillar D-7 #16708 with Caterpillar 25 and Caterpillar 7S or 7A Blade. NEW Warranty. F.O.B. 11,500.00

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190 @ 1800 RPM
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1 American Model 275 dragline.
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Straight Dozer under 1700 hours.

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Complete with troughing and return rolls, gravity take-up assembly and belt. Used 7 months and in very good condition.

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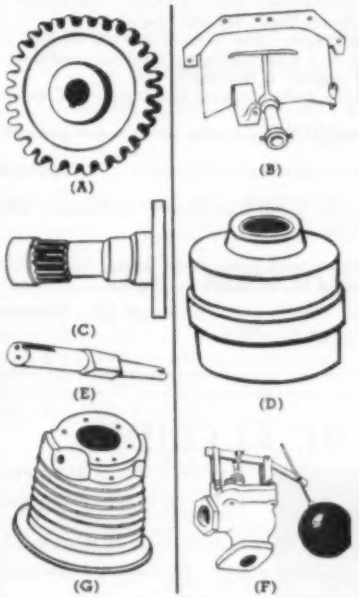

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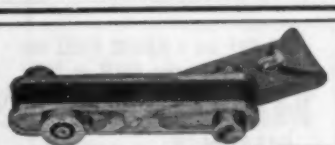

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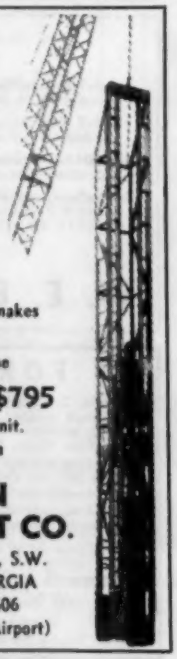

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A.C. HDS $500

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CONSTRUCTION MACHINERY
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YOnkers 9-6752

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Fairbanks-Morse O.P. 5¼" Cylinder Liners. Each	$125.00
Cooper-Bessemer CB0420C Cyl. Heads W/Valves. Each	355.00
Cooper-Bessemer GSB4J Wrist Pins. Each	20.00
Enterprise 16" 92683 Air Starting Valve Assembly. Each	48.00
Superior YPTD5017A4 Cylinder Heads. Each	175.00

O.P. 5¼" Piston and Conn. Rod Assembly, O.P. 8½" Pistons, O.P. 10 Cyl. Blower Rotors and Vertical Drive Gear Sets.

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G. F. Pincelli CONTRACTOR

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Lorain Moto-Crane Model 254W—35,000 pound capacity. #27670 mounted on a 6 x 4 carrier, #6930. Purchased new in May of 1956, it has been used very little. It has a 65 foot boom and a fair load for a dragline bucket. Power up or down. It has been used 600 working hours. $34,000 Cost. $22,000 Selling Price.

HD 5G Allis-Chalmers Bucket Loader. It is a 1952 Model. It has been completely overhauled and is in excellent condition. $12,000 Cost. $6,000 Selling Price.

Ford Major Tractor—Sherman Backhoe, #2282, Front and bucket loader. A downward reach of 12½ feet and an upward reach of 8 feet. Purchased new in September of 1956. It has been used 800 working hours. $8,500 Cost. $6,000 Selling Price.

John Deere Crawler Dozer—Model 420—8 foot angle blade. Purchased new in March of 1958. It is in excellent condition. It has been used 150 working hours. $4,600 Cost. $3,500 Selling Price.

Buffalo-Springfield 5 Ton Tandem Roller, #K7. It is a 1955 Model and has been used very little. $4,500 Cost. $3,000 Selling Price.

FALL INVENTORY REDUCTION!

CASE—"500"—Gas Crawler Terra-Trac w/Hyd. Front End Loader.

I-H-C—"I-9"—R.T. Ind. Tractor w/Hyd. Front End Loader.

CATERPILLAR—"D-2"—Diesel Tractor w/ Traxcavator Cable Loader. Buy for parts. Make your own price!

BARBER-GREENE—"552"—Bucket Loader.

INSLEY—"K-12"—½ Yd. Magnet Crane, complete.

QUICK-WAY—"E"—4/10 Yd. Trench Hoe or Crane, mounted on GMC 6x4 Truck.

LORAIN—"TL-20"—½ Yd. Crawler Trench Hoe.

LORAIN—"TL-25K"—¾ Yd. Crawler Dragline.
SARGENT—"410" — New 25" Boom. Discounted.

SMITH—3 Yd.—Transit Mixer, mounted Chev. Tandem Truck.

JAEGER—3 Yd.—Transit Mixer, mounted Chev. Tandem Truck.

ROGERS—15-Ton—Tandem Low Boy Trailer, drop deck.

JAHN—"THL-420"—Tandem Low Boy Trailer, flat deck.

EIGHMY EQUIPMENT COMPANY
120 S. Pierpont — Phone 4-6706
ROCKFORD, ILLINOIS

FOR SALE

New Northwest 25 - ¾ yard Dipper Stick	$ 700.00
1 Yard Clam Shell Bucket	400.00
10,000 feet 4" Cast Iron Water Pipe, per ft.	.50
145x26 foot Steel Barge with 11 foot sides	5,000.00
110x32 foot Steel Barge, 5 foot sides	3,000.00
85, 110, 130 lb. Railroad Rails in 33 ft. lengths. Per ton	60.00
300 tons ½" steel plate 8 x 15 ft. sheets. Per lb.	.03½

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1705 North 4th Street - Wilmington, N. C.

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3—35 Ton American Truck Cranes.
1—30 Ton American Truck Crane.
1—35 Ton Link-Belt Truck Crane.
1—30 Ton Link-Belt Truck Crane—4 Axle.
1—30 Ton American Wagon Crane.

These units are all 1957 Models and are in like new condition.

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Perfect for clearing land, felling trees, wrecking houses and demolition of all kinds. Sherman Model M36B2

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"88" BACKHOE and SPECIAL Heavy Duty LOADER

Economy Priced!

Today's fastest backhoe. Digs 12' deep, dumps at 9'9", swings 188°. This hard-working tool reduces costs, requires minimum maintenance — it is versatile and moves easily from location to location. Built by the pioneer of the hydraulic backhoe.

Send for specifications and prices.

Loader Attachments:

Various sizes Utility and Material Buckets, Snow Bucket, Angle Dozer Blade, Bulldozer Blade, Crane Hook, Fork Lift, Manure Fork and Street Broom.

Serving in many industries all over the world.

SHAWNEE MANUFACTURING CO., INC.

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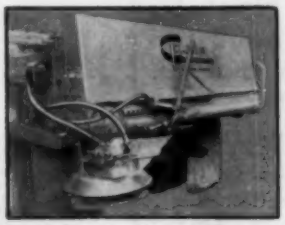
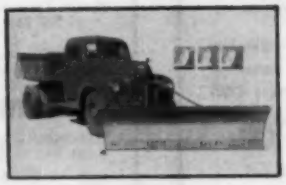
Before You Buy—See the Latest Developments By

FLINK SPREADERS



For Fast Efficient Ice Control. New model illustrated spreads from left side only . . . saves material and gives better pattern. Also choose from many other hydraulic, cab-operated spreaders; PTO or engine driven hopper types; or the low cost pull-type spreader.

Baker-Flink SNOW PLOWS



For Safe, High Speed Snow Removal. Reversible and one-way plows for 1½ to 5 ton trucks and up. Hydraulic power lift controls to meet your specifications. Underframe or front push models.

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NEW PRICES TOO HIGH? *SAVE MONEY ON THESE*

CATS — EUCLIDS — LE TOURNEAUS!

3—CATERPILLAR DW21's 1900 hrs. .....from $32,500.00
7—CATERPILLAR D8 Dozers & Push Tractors, 15A & 2U Series .....from 6,500.00
4—CATERPILLAR DW20 Tractor & Scrapers, 21C Series .....from 15,000.00
5—CATERPILLAR D9 Dozers & Push Tractors, 19A Series .....from 30,000.00
4—B TOURNAPULLS, One & Two years old, Cummins Diesel .....from 26,800.00
4—C TOURNAPULLS, Cummins or GMC Diesel, 1 to 5 yrs. old .....from 11,000.00
3—AC HD20 and 1—HD19 Push Tractors, 4 to 6 yrs. old .....from 3,500.00
2—AC HD21 Push Tractors, Used only 2 seasons, 3 yrs. old .....from 9,500.00
1—IH TD24 Dozer, 3 yrs. old, Retracked & reworked 8,500.00

ONE COMPLETE—EUCLID SCRAPER & BOTTOM DUMP SPREAD—Consisting of 8—14TDT Tractor & Wagons with 8 Model S18 Scrapers. This group we would like to sell as a package but will entertain alternate offers.

1—PARSONS Model 310 Ditcher. Like New, make offer.

3—EUCLID Mod. 108 Bottom Dumps, 25 yd., 25.00 x 33 tires—make offer.
1—EUCLID Mod. 108V Loader, Cost $52,500.00 new—Our Price $20,000.00
4—CATERPILLAR No. 12 Motor Graders, 8T-1 to 8T-7 Series .....from 7,800.00
3—ADAMS Mod. 440 Motor Graders, 3 mo. old, like new .....from 13,500.00
1—LE TOURNEAU Mod. M Scraper, Excellent Shape, Good Rubber 2,650.00
1—LORAIN Mod. 820 Crane, Excellent working condition 23,500.00
1—BLAW KNOX Spreader, 25', This is a new machine—Save $3,000.00
1—KOEHRING Bull Float, Good Working Condition, 24' 4,875.00
1—BLAW KNOX Finishing Machine, to 24', Priced at 11,500.00
1—BLAW KNOX Spreader, Ready for work, Priced at 14,800.00
1—NORTHWEST Mod. 6 Backhoe, Murphy Diesel, Top Condition 36,000.00
3—*REX, 3 Yd. Truck Mixers on International Chassis—Make Offer*

OUR BUY OF THE MONTH: 1 Complete JOHNSON BATCH PLANT, TY Series, ONE STOP DESIGN: All the latest features to facilitate high production handling of materials. *Includes:* Johnson Bin & Recording Equipment, Beam Balance, Sieve Shaker, Pans, Sand Attachment, 876 BBL Cement Silo, Cement Elevator, Screws, Aggregate Hoppers, One 24" Belt Conveyor, One 12"x164' Belt Conveyor, One 24"x195' Belt Conveyor, Vibrating Screen, Gravel Hopper, Complete Scale Set Us, and related assemblies.—This is a modern well designed plant and cost over $160,000.00 one season ago. It runs and has been maintained like new. Will handle 200 to 250 batches an hour with ease. Can keep three pavers going time to spare. Will be well worth your rigid inspection. This will sell in a hurry at $87,000.00—CALL—WIRE—or Come and See this plant today.
All equipment is located in the general Chicago area and subject to prior sale. Many of the above machines are 1 to 2 years old. We have priced these late model machines at half current prices. They represent well maintained equipment. We have priced them to . . . SELL.

AMICAL EQUIPMENT COMPANY

BOX 425 OAKTON ST. PHONE VAnderbilt 4-4445 DES PLAINES, ILL.

With the Manufacturers and Distributors

CYRIL D. JENSEN, Professor of Civil Engineering and head of the soil mechanics division, Fritz Engineering Laboratory at Lehigh University has been given leave of absence to become Director of Research and Testing for the Pennsylvania department of highways.

CLARENCE E. BOVEY, engineer of city and cooperative projects, has retired from the California division of highways after more than 44 years of continuous service. He has been succeeded by Melbourne H. West, recently assistant planning survey engineer of the division.

T. RANDOLPH RUSSELL has resigned as press and research assistant to Senator Strom Termond of South Dakota, to become director of public relations for the American Roads' Association, Washington, D.C. Russell succeeds Robert L. Smith who died recently.

ESTABLISHMENT OF THE GENERAL OFFICES OF CLARK EQUIPMENT INTERNATIONAL, C. A.; at Havana, Cuba, has been announced by W. E. Schirmer, president.

H. O. PENN MACHINERY CO., INC., of New York is providing more parts representation for Caterpillar equipment for Westchester, the Bronx and lower Connecticut. Frank Crehan, whose experience with the company dates back to 1950, has been selected as Parts Representative for this territory.

THE PROMOTION OF HARRY MOVSESIAN to manager, truck tire sales for The General Tire & Rubber Company's Twin City division has been announced by L. L. Higbee, trade sales manager.

JOHN L. GROTON has been appointed to the newly created position of Director of Advertising and Sales Promotion for Essick Manufacturing Company of Los Angeles, Little Rock, Arkansas and Elizabeth, New Jersey according to Bryant Essick, President of the company.

CURTISS-WRIGHT CORPORATION, Wood-Ridge, New Jersey, announces the delivery of the first units of a $500,000 order for earth-moving equipment, making the start of its South Bend Division in the manufacture of such units.

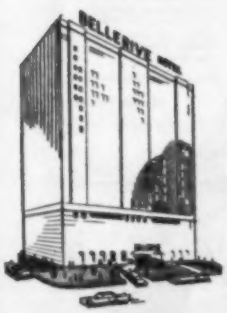
This order was placed by Madonna Construction Company, of San Luis Obispo, California. The sale covers nine 20-yard self-propelled scrapers.

APPOINTMENT OF C. P. SHAW as sales promotion manager, Maintenance Inc., Wooster, Ohio, is announced by Robert A. Tissot, president. In his new post, Mr. Shaw will be in charge of advertising and promotion for Jennite J-16 asphalt surface seal and related products.

J. Q. A. GREENE, Exec. Vice Pres. of Gunite Concrete and Construction Company, Kansas City, Missouri retired from executive duties on October first, after 36 years of service with the company. He now moves to Los Angeles, Calif., where he will become West Coast Representative of Gunite, starting January 1, 1959. Good wishes, Mr. Greene.

PREFERRED in KANSAS CITY, MO.

by BUSINESSMEN, EXECUTIVES, FAMILIES



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Free Parking

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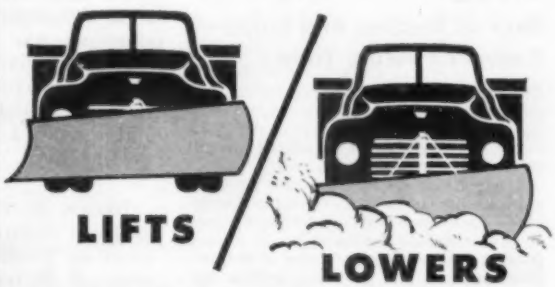
20 S. Dearborn Street



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POWER MONARCH HYDRAULIC CONTROLS

Instant action! Snow removal is easier, faster, more efficient. Automatic snow plow operation right from the truck or jeep cab. Battery-Operated or Fan-Belt Driven Models. See your dealer or write for full information.

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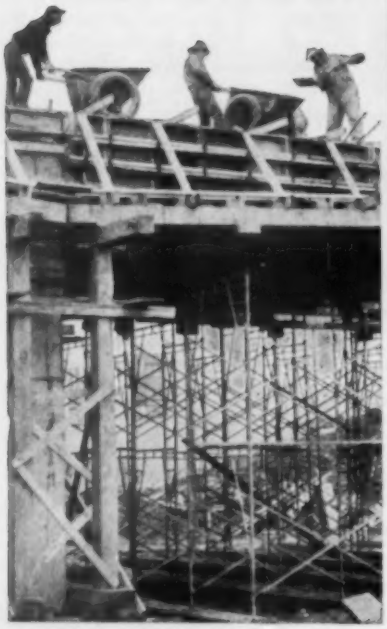
Bridge Forming



Symons Forms Cut 100 Days Off Bridge Forming Job

Ease of Erecting and Stripping Reduces Pouring Time

Contractor Lee Hoffman, Beaverton, Oregon, was given 320 days to pour 4,000 cubic yards of concrete for a bridge over Myrtle Creek in Oregon. Job was complete in 220 days or only ⅔ the time allotted.

Harry Pajutte, Chief Engineer for Hoffman, credits the ease of erecting and stripping Symons Standard High Strength Forms with contributing substantially to cutting pouring time, reducing number of men required on job, and providing greater mobility for the pouring equipment. Only

JUST 3 PIECES

3,144 square feet of panels were required for the 160,000 square feet of forming.

Symons Forms, Shores and Column Clamps can be rented with purchase option. Facts on Symons products and engineering service available upon request.

Symons

SYMONS CLAMP & MFG. CO.

4283 Diversey Avenue, Dept. L-8
Chicago 39, Illinois

. . . for more details circle 309 on enclosed return postal card

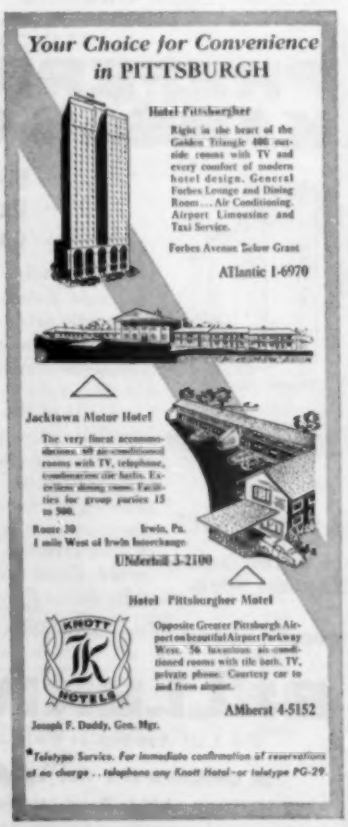
Clark Equipment Opens Warehouse for Chicago Area

Clark Equipment Company's new Central Parts Division is a modern 7½-acre warehouse ten minutes from Chicago's Midway Airport and having immediate access to railroad, truck, bus and water transportation. The new facility, which stocks 4½ million parts, has electronic and integrated data processing equipment to expedite handling of dealers' orders, a 468 ft. long conveyor belt for moving parts to packers.

THE FIRESTONE TIRE & RUBBER COMPANY has granted royalty-free licenses to companies in the tire and rim manufacturing business to manufacture, use, and sell a new standard tubeless truck tire and a one-piece drop-center rim which Firestone developed and for which the company was issued a patent in December 1957. These companies are members of the Tire & Rim Association, which has made this tire and rim an accepted standard for the industry.

JOSEPH R. HUTCHINSON, former oil plant executive, is the new president of Traffic Equipment Company of Denver, Colo., manufacturer of the "Sentry" line of traffic control safety devices comprising 57 different barricades, stands, flashing lights and accessories. Under the new ownership, Mr. Hutchinson will act as president and director of sales. Mr. John Dilatush, former owner, will continue as general manager of operations. The present dealer organization is being retained with significant additions.

DIRECTORS OF THE GOODYEAR TIRE & RUBBER COMPANY meeting in October, named E. J. Thomas, chairman of the Board of Directors, succeeding P. W. Litchfield, who becomes Honorary Chairman. Thomas continues as the company's chief executive officer. Russell DeYoung, executive vice president, succeeds Thomas, becoming the company's ninth president. P. E. H. Leroy, executive vice president, has been elected Vice Chairman and continues as the company's chief financial officer.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Joseph F. Daddy, Gen. Mgr.
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L. E. BLANCHETT, chief-engineer-large excavators, Bucyrus-Erie Co., South Milwaukee, Wis., spoke at a regional meeting of the American Institute of Electrical Engineers (A.I.E.E.) Sept. 30 at Eveleth, Minn. He presented an analysis of electrical shovel power and control systems, and explained the practical advantages, of DC excavator drive.

PRODUCTION OF HIGH-STRENGTH, STRESS-RELIEVED, 7-WIRE STRAND for use in pre-stressed concrete construction has been started at the Sparrows Point plant of Bethlehem Steel Company. New equipment will stress-relieve the strand by induction heating rather than by the conventional hot-air or lead bath.

The Export Department of LeTourneau-Westinghouse Company has named Kent Bartlow as its Washington Representative according to an announcement by P. E. Fulford, vice president and export manager, from the firm's Peoria, Illinois headquarters.

Mr. Bartlow will handle technical and sales liaison between the firm and U. S. and foreign government agencies in matters of export trade. His headquarters will be at the LeT-WesCo. Office, 1200 18th Street, N.W. G. W. Laughlin, formerly representing the Company in Washington, has moved to Mexico City to become manager of Distribuidora de Equipos de Construccion, S. A. de C. V.

New Caterpillar Tractor Plant Near Aurora

Located on a 352-acre site three miles south of Aurora on Route 31, Caterpillar Tractor Company's newest plant will have 1,280,000 square feet of manufacturing space under roof. About 3,000 persons will be employed at full production, under the direction of A. N. Whitlock, plant manager. Although construction is still under way throughout the plant, limited production is beginning on D4 tractors. Full-scale operations are scheduled for 1959.

ORGANIZATION OF B. F. GOODRICH AUSTRALIA, LTD., has been announced by W. C. Gulick, president, International B. F. Goodrich Company, a division of The B. F. Goodrich Company. Associated in the new company will be Ampol Petroleum, Ltd., and other Australian investors. Construction of a plant near Melbourne, Victoria for the manufacture of tires, other products, will be started before January 1.

WHAT ABOUT YOU, MR. READER?

Are you still active in the field? Have you moved or changed your position?
Unless you send this information directly to us we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. *Your* name might be cut from the mailing list.

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